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## The Future of the Giant Pneumatic

FIVE years ago it was predicted by tire experts that the solid tire would in time be produced in greater quantity than the pneumatic. This was based upon the sound assumption that light trucks, delivery wagons, buses and vehicles for business use would outnumber pleasure vehicles. The prediction, however, did not take into consideration the pneumatic truck tire. The success of the giants scored such a victory for pneumatics that there is no apparent present or future chance that solids will ever catch up.

So eminent an authority as David Beecroft, president of the Society of Automotive Engineers, sees in motor bus transportation "one of the developments of the age." In other words, what the railroads, steam and electric, did as developers and carriers on rails, the motor bus will do on highways. It would appear that the future premier user of rubber and fabric will be the giant pneumatic.

## Making Gutta Percha of Rubber

FROM the time of Goodyear efforts have been made to treat gutta percha so that it would vulcanize and have at least a portion of the elasticity of rubber. The early experiments were not successful. Gutta was hardened until it approached vulcanite, but it did not take on resilience. A recent process patented by Peachey, however, indicates that a certain elasticity is added to gutta when vulcanized by his process.

This is very interesting but is not a present necessity. The world has thousands of tons of elastic gum for which there is no market. What is needed is to make gum elastic into gum plastic. If our chemists would turn india rubber into gutta percha they would help the arts enormously. Furthermore the product would command a high price for a long time and would help to use up surplus crude rubber.

## Rubber Latex Paper and Rubber Paper

WITHIN the past year the Editor of THE INDIA RUBBER WORLD has communicated with a number of prominent paper manufacturers to see if it were possible to induce them to experiment with india rubber in some form as a binder and strengthener for paper pulp, particularly in view of the vulcanization possibilities of the Peachey process. Very little interest, however, was developed and no progress made. Right in the line of this suggestion comes the record of the experiments and patents of Frederick Kaye, A. R. C. S.

Instead of using crude rubber Mr. Kaye mixes rubber latex with the pulp in varying quantities up to 20 per cent. The work is done on ordinary paper-making machines, the latex being mixed in the beater. When the beating is finished a coagulant is added and the pulp is then run through the paper-making machine. After the paper is run and dried it may be vulcanized, preferably by the Peachey process, or in many cases no vulcanizing is necessary.

It is claimed remarkably good paper resulted from 0.5 to 5 per cent of rubber added to the weight of dried paper. It is claimed that the famous "Kraft" process paper has been thus equalled. The quality of any paper is not only improved but the time of beating has been in many cases considerably shortened.

Experiments made with ordinary fiber containing one-tenth per cent of rubber, tested on a Schopper folding machine, possessed a folding number of 5,000 to 6,000 with a tensile strength two or three times greater than that of the same material made without rubber. Paper containing one per cent of rubber had a folding number of 72,500 with a tensile strength of 81 pounds for an inch-wide strip.

The above tests were made of paper containing rubber latex not vulcanized. The production of small quantities of paper in which rubber latex is used as a laboratory experiment involves no particular difficulties. Were the

paper manufacturers, however, inclined to use latex in quantity in their product, the question of supply would require consideration.

As freight steamers are equipped with tanks to hold liquids, and are daily bringing coconut and other oils in bulk from the far ends of the earth, the problem of supply and transportation is not insuperable.

It is however perfectly possible that rubber and not rubber latex could easily be incorporated with paper pulp. Indeed it has been done. Goodyear's book, "Gum Elastic," was printed on paper made of wood pulp and india rubber. Curiously enough at this time comes the record of Dr. Hall in his examination of desert plants and their rubber content. The most interesting of them all was the *Asclepias subulata* containing some 6 per cent of rubber and a very excellent paper-making fiber. Here we have Nature mixing the latex beforehand with the pulp, which combination logically should make an ideal self-mixed rubber paper.

The combination of latex and fiber suggests also a new use for the Castilloa. It will be recalled that some twenty millions of American money went into Castilloa plantations in Mexico and Central Mexico. The tough fibrous bark of the Castilloa has long been used by the natives for mats and for a variety of uses where strength and flexibility are required. It is in this bark that the lactiferous ducts are found. Here is, therefore, an ideal rubber latex fiber. Moreover, the Castilloa for the first two or three years of its life is as rapid a grower as the famed balsa. As a rubber pulp proposition it therefore has possibilities.

## Psychology in Market Making

To the average manufacturer or merchant psychology is "bunk." Main strength and hustle are preferable and more understandable. Yet the recent flood of orders that poured in upon manufacturers of four-buckle arctics was the direct result of a deep knowledge of youthful feminine psychology. It is an open secret that one of the big eastern rubber shoe factories has gone strong on efficiency, psychology, psychiatry, indeed almost every modern "ology" with the exception perhaps of relativity. What more natural than for one of its scientific observers to arrange that a couple of the really fashionable débutantes should appear with unbuttoned arctics as an adjunct to a costume otherwise wholly swagger. His knowledge of maiden psychology led the investigator to believe that this would be promptly imitated by the rest of the fashionable or would-be fashionable flappers. In a very short time also it would spread to high school and college. It would next be adopted by the young-old women, married and single, and the market be made. His experiment was a huge success. Arctics were sold in unprecedented volume through an understanding of feminine psychology.

If taken advantage of, the rubber trade can profit greatly by the same sort of effort in other lines. Take for example the rubber pavement. The sponsors for it are failing wholly to take into account the attitude of those who have the say at least in American road building. It does not appeal to a politician or a contractor to show him road material that will last 20 or 30 years without repair. Indeed it inspires him with disgust and fear.

If the inventors of rubber paving blocks would produce something apparently better than any other paving material, but that in reality required replacement every six months, the city fathers would fall over each other in adopting it, small town bosses would put it in by the mile, and the crude rubber surplus would disappear.

## Service Specifications

From the point of view of the specifier the specification is a necessary and elaborately beautiful document. It guards against the use of materials that are supposed to be injurious, and insists upon the presence of others thought necessary to perfect work. Many times they accord with what the manufacturer would do. Sometimes based upon half-knowledge they are a handicap and frequently a damage. The specified use of Pará rubber when other sorts would give better results, the mandate against reclaimed rubber where it is of distinct value, are typical. The fact is the buyer desires service, and that is all he is entitled to. As to what mode of manufacture is followed or what combination of materials the manufacturer uses it is no concern of his. It often happens that a certain amount of reclaimed rubber added to Pará would give a far better compound than Pará alone. Nevertheless the specifications usually call for Pará. So, too, mixtures of Pará, Centrals and Madagascar for certain uses are better than Pará alone.

These are but a few of the host of compounding facts that are known to manufacturers, but not to the builders of specifications. The truth is, all compounding progress has come through the complete ignoring of specification wisdom. For example, had the motor tire of the last ten years been built to specification the average mileage would be today less than 3,000 miles.

In their own interest the specifiers should demand service only, and leave the manner and matter of the accomplishment to the manufacturer.

One makes a wonderful belt of cotton duck and upriver fine Pará. If a competitor can make a better belt of goat hair and chewing gum he should have that privilege. If, however, he is obliged to use only cotton duck and Pará he is set back just so far, and the industry as a whole suffers. If, therefore, those conscientious and particular gentlemen who issue specifications by the square yard, would in the interest of efficiency demand service, and service alone, they would do much for a long-suffering constituency. Rubber manufacture cannot be held in leading strings by outsiders, nor for that matter by insiders either. It is a great, intricate, constantly changing industry. None other approaches it in its diversities and its daily discoveries. To develop, it must be free.

# Rubber in Radio Sets

## Hard Rubber Is Unexcelled for Radio Purposes—It Is Exclusively Used in Highest Type of Radio Instruments

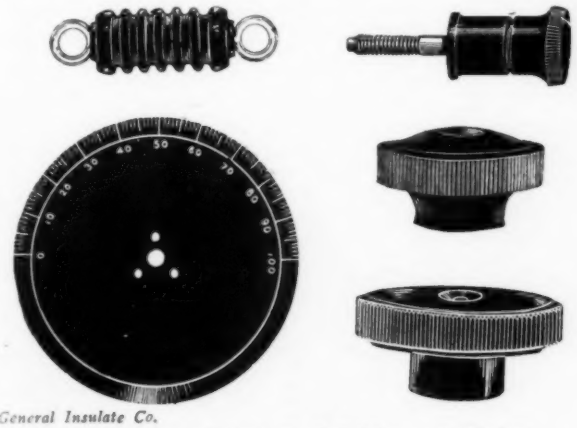
### Popularity of Radio Telephony

THE fascination of wireless communication has stimulated a phenomenal growth of popular interest in radio telephony. The best available statistics indicate that a year ago there were about 25,000 radio operators in the United States. This number has already increased to several hundred thousand and

*International*

**General John J. Pershing, Commander of the American Army, "Listening In"**

government officials predict that before the end of this year there will be installed throughout the United States a minimum of 1,000,000 radio-receiving sets for hearing the radio programs of music,



*General Insulate Co.*

**Typical Parts of Both Hard Rubber and Molded Insulation**

lectures, news, etc., that are broadcasted daily across the country from stations located near the more populous centers.

### Demand for Parts

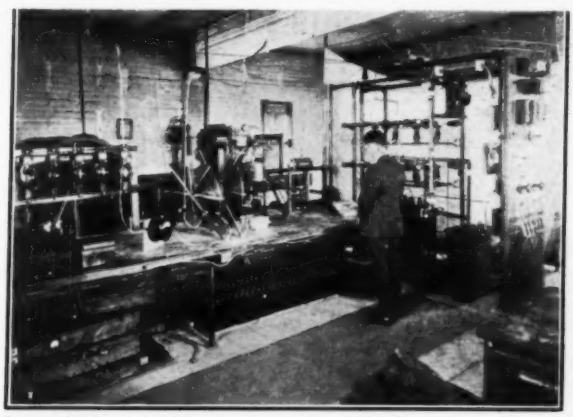
The radio-receiving or sending set is approximately 90 per cent insulation. A score or more of applications might be named in each of which the parts are being made in 100,000 lots, so great is the unprecedented demand caused by the sudden and well-nigh universal accession of amateur enthusiasts in the radio field. This demand has practically swamped the capacity of hard rubber mills and producers of synthetic molded goods. One of the largest makers of radio insulation reports that his output of goods increased over 400 per cent during the first three months of this year.

### Future Growth

The potential demand in the United States and Canada for radio-telephone receiving-sets has been placed at one for each family. An average outlay for each set, which is not unreasonable, will involve the expenditure of approximately a half-billion dollars on the part of the general public. The inevitable discarding of the cheaper sets for the more expensive ones of greater range, the purchase of improved devices and supplies, will result in a large and permanent business.

### Hard Rubber

Hard rubber and molded synthetic resinous products find numerous applications in every radio telephone-set in the form of



*International*

**Most Powerful Broadcasting Station—Radio Broadcasting Room of the General Electric Co. at Schenectady, N. Y.**

sheet stock for panels and set boxes, for mounting apparatus, rods, tubing, knobs of many sizes and styles, receivers and ear-caps for head-sets, battery jars, insulators for aerials, etc.

Hard rubber is a better insulator at the very high frequencies than such materials as the ordinary synthetic resin compounds available to the amateur. For this reason it should be used when it is necessary to insulate high-voltage high-frequency leads. The requirements demanded of the material besides high dielectric quality are good machining properties. The material must be readily sawed, drilled, tapped, etc. From the standpoint of ease of machining, combined with its dielectric quality, hard rubber is superior to the synthetic molded materials. The latter, however, were first in the radio field and in point of view of cost they possess the field in radio work. Nevertheless, the demand is so great and insistent that manufacturers of hard rubber are crowding their facilities to the limit in the production of parts for the higher grade instruments. In this connection the leading hard rubber manufacturing company has developed, after extensive re-

search, a special stock for panels, boxes, tubing, rods, etc., that has superior physical and electrical properties over commercial hard rubber sheet. It will neither bend nor warp by temperature changes and is capable of high polish. It is made with wood grain in "mahoganized" effects in brown and black, as well as in plain black or brown.

Panels of hard rubber for mounting apparatus are furnished polished in standard size sheets 20 by 48 inches of thicknesses from ⅛ to 7/16-inch. The usual panel thickness is ¼ to 3/16-inch. Generally, hard rubber panel stock is furnished polished and cut to size with edges ground to fit the front of the cabinet.

### Hard Rubber Essential for Best Results in Head-Sets

The radio head-set is one of the most important parts of a wireless receiving-set. It must be made as sensitive as possible because of the extremely minute current with which it is expected to operate. Hard rubber has proved to be the most satisfactory material of which to make the ear-caps because it admits of machining with the extreme accuracy necessary, while other stocks do not. Therefore it is always used as caps in the highest type of head-sets and in the navy set as a bridge on the back of the receiver to which connecting wires are attached. Internally, also, a hard rubber washer is used advantageously.

"Navy" Type Radio Head-Set

### Soft Rubber

Very little soft rubber is used in radio. It is chiefly used as insulation on leads from the aerial wires and in a few minor but important locations in instruments, for example, as a flexible support for vacuum-tube sockets to eliminate vibrations.

## Rubber Trade Inquiries

*The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.*

(984) The address of the owner of the trade mark "Lowenthas" on rubber sheeting is requested.

(985) Inquiry is made for the addresses of manufacturers of or dealers in glazed holland for lining rubber tape and similar products.

(986) A subscriber desires the address of a manufacturer specializing in crimping machines for thin sheet rubber work, such as bathing caps.

(987) An inquiry has been received for the address of manufacturers of machinery for making complete bathing caps with minimum amount of labor.

(988) A reader desires the address of manufacturers of separators for grading hard rubber dust.

DR. NORTON F. W. HAZELDINE, THE WELL-KNOWN DEHYDRATING expert of Los Angeles, California, recently said: "THE INDIA RUBBER WORLD is a remarkable publication. A glance at its pages is sufficient to convince one that its field is not local but world wide. I enjoyed immensely perusing a recent copy."

## Trade Opportunities from Consular Reports

*Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following districts or cooperative offices. Requests for each address should be on a separate sheet and state number.*

| DISTRICT OFFICES | COOPERATIVE OFFICES |
|---|---|
| New York: 734 Customhouse. | Cleveland: Chamber of Commerce. |
| Boston: 1801 Customhouse. | Cincinnati: Chamber of Commerce; General Freight Agent Southern Railway, 96 Ingalls Building. |
| Chicago: 504 Federal Building. | Dayton, Ohio: Dayton Chamber of Commerce. |
| St. Louis, 402 Third National Bank Building. | Los Angeles: Chamber of Commerce. |
| New Orleans. 1020 Hibernia Bank Building. | Philadelphia: Chamber of Commerce. |
| San Francisco: 307 Customhouse. | Portland, Oregon: Chamber of Commerce. |
| Seattle: 848 Henry Building. | |

(1120) A merchant in Norway desires an agency for fire hose. Quote c. i. f. Norwegian port. Payment through Norwegian banks.

(1126) An American firm with traveling representative in Brazil and Uruguay desires to represent firms for the sale of garters, suspenders, and arm bands.

(1184) A commercial agency in Germany desires to represent firms to sell products as cotton, linters, chemicals, and rubber.

(1191) A firm in Mexico desires exclusive agency for a good tire and inner tube. Quote f. o. b. factory. Cash with order.

(1216) An importing firm in the Straits Settlements desires to communicate with United States manufacturers and exporters of rubber and rubber goods.

(1230) A firm of merchants in Czechoslovakia wishes to purchase technical fats, resins, paraffine and ceresin. Quote in German, c. i. f. French, German, or Holland ports.

(1265) A firm in Spain desires to purchase rubber goods. Quote with catalogs and price lists, c. i. f. Spanish port.

(1272) A commission agent in Palestine desires to purchase and secure an agency for overshoes, canvas shoes for summer wear, toilet articles, and raincoats with hoods. Quote c. i. f. Jaffa. Cash against documents.

(1280) A merchant in Madeira desires to purchase and secure an agency for rubber goods, tires, and inner tubes. Quote c. i. f. Madeira.

(1281) A mercantile firm in Spain desires to purchase belting of balata, etc., packings, rubber in sheets, and naval stores. Quote in Spanish, c. i. f. Spanish port.

(1291) Exclusive agency is desired by a firm in southern Italy to sell transmission belts of rubber, fabric, etc. Quote in Italian, c. i. f. Italian port. Bank guaranty, payment after sale of goods.

(1302) Firms in Spain desire to purchase belting, packing, rubber goods, and diving sets. Quote in Spanish, c. i. f. Spanish ports, with catalogs.

(1310) Quotations in Spanish are requested, c. i. f. Spanish port, on fountain pens.

(1322) A corporation in Sweden desires agency for all kinds of belting, and articles for the mining industry. Quote c. i. f. Swedish port.

(1337) A mercantile firm in England desires an agency to sell druggists' sundries. Quote c. i. f. English port or f. o. b. New York.

(1360) The owner and manager of a garage and repair shop in Spain desires to purchase and an agency for tire casings, vulcanizers, and repair equipment. Quote c. i. f. Spanish port. Cash.

(1377) Quote c. i. f. Genoa on rubber combs.

### Trade Lists Available

Under the reference number BE1029, the Commercial Intelligence Division of the Bureau of Foreign and Domestic Commerce has recently compiled a list entitled, "Tire and Motor-Car Accessory Dealers in Canada." Mimeograph copies of this list may be had on application to any of the offices of the bureau, mentioning the reference number and title.

# Vacuum Process of Hollow-Ball Making[1]

## The Vacuum Process, as Typified in Hollow-Ball Making, Is Revolutionizing the Production of Hollow Rubber Goods of Every Kind

HOLLOW balls are formed from calendered sheet rubber. The first method consisted in uniting four quarter-sections into a rough ball by hand and mold-curing by steam and internal pressure for inflation. Machine-made balls have been produced

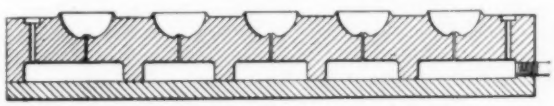


**Fig. 1.—Cross Section Forming Mold**

for many years; in fact, the patents on the principal machine for this purpose expired a number of years ago. The most recent development in the manufacture of hollow articles of rubber is the Roberts vacuum process, fully covered by a series of patents.

The machinery and methods employed are of interest because they have been accepted as practical and in fact revolutionary in the manufacture of hollow articles of rubber, as regards both quality and cost.

Beginning with the calendered sheet stock, cut into squares to fit the ball-forming mold, to half of the sheets uncured pure gum valve plugs are applied by hand, one for each ball, spaced by a sheet-metal template laid over the square of rubber. Thus prepared the stock goes to the forming machine. This is an unheated hydraulic press containing the ball mold which comprises two parts with cavities that register accurately. The construction of this mold is shown in Fig. 1 and a view of the half-mold in Fig. 2. Referring to Fig. 1, the ball cavities are seen to be individually connected with a space below them in the mold. This is provided with a pipe by which connection is made to an air exhaust or vacuum pump. In the bottom of each ball cavity there is a central hill-like protuberance. See Fig. 2. The function of this is to increase the area of rubber formed into a ball for the double purpose of expelling the ball biscuit from the mold by reversing its position under expansion and providing stock for expansion during cure, in this way obviating thin spots in the wall of the ball at the poles.

The edges of the hemispherical cavities stand above the general level of the mold, serving as cutting edges and pinching through

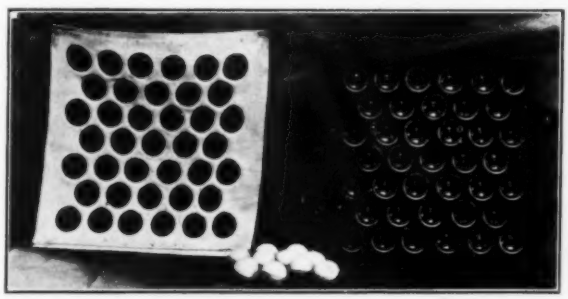


**Fig. 2.—View of Forming Mold, Biscuits and Waste**

the ball stock to form the seam. Two operators handle each ball press. A square of rubber stock is laid on the bottom half of the mold and held in close contact with it under a surrounding wooden frame, thus forming a close joint between sheet and mold. When the exhaust valve is opened the sheet promptly conforms to the contour of the cavities. One operator with bulb syringe places a little ammonia water in each cavity while the other lays another square of rubber on a tray of muslin in a wooden frame and both hold this sheet against the upper half of the mold. The vacuum is applied by the valve and the sheet drawn into cup forms corresponding to the cups in the lower sheet. Before closing the press, one of the operators, with a pad moistened with gasoline, wipes the edges of the cups to remove any dust or moisture. The press is then closed by hydraulic pressure and held closed briefly. The soft uncured stock is cut through as the edges of the cups meet and a perfect joint is made under practically no internal pressure. The surrounding sheet waste resulting from cutting the ball biscuits

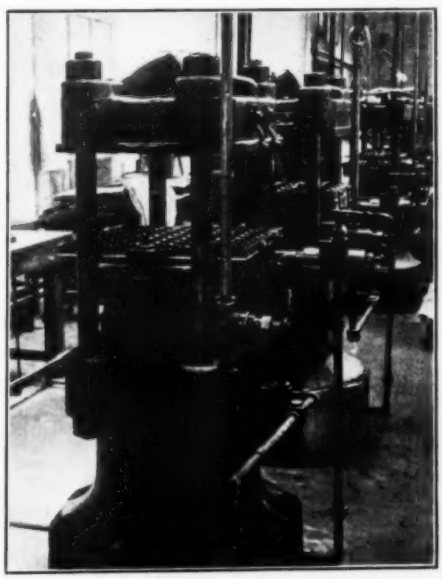


**Fig. 3.—Biscuit Forming Press**

amounts to about 66 per cent and is taken care of by being recompounded in that proportion in new batches. The roughly formed balls or biscuits rise out of the molds by reason of the slight air compression which reverses the elastic stock bent inward at the poles. It is found that the ball seams become closer knit on standing, consequently the balls are held in stock for 12 hours before curing.

### Ball Curing

Ordinary hydraulic steam platen presses are used for curing. The molds are of steel or paralite metal, made without overflow grooves. In the case of machine-made balls the biscuits are placed in the molds with the seams vertical to lessen the strain upon the joint during mold inflation as the ball diameter at the seam is full size. In the case of vacuum-made balls the seam is placed to conform with the mold joint and the excess of stock due to the ball formation in the vacuum mold allows the ball to fill the curing mold without reduction of wall thickness. Paralite molds are preferred for curing balls because they are light in weight and the metal conducts heat rapidly and takes a high finish which it imparts to the goods. The cure is about ten minutes at 60 pounds

[1]Illustrations supplied by Paramount Rubber Consolidated, Inc., Little Falls, New Jersey.

of steam, cooling in the press for about the same time before opening the molds. If opened too hot the balls will distort or burst by the internal pressure of ammonia and steam.

The seam is so perfect in vacuum-made balls that seconds or leaky balls are practically unknown. This is because no strain is placed on the seam until the ball is fully cured. Further, the size of the ball biscuits is so uniform that the mold overflow or waste is only a thin fin that is easily removed by friction in a tumbling barrel.

### Inflating Balls

In order to give hollow balls a lively rebounding quality they are inflated with air under pressure, after curing. This is done by means of a hypodermic needle inserted through the uncured rubber plug attached on the inside. When the ball is suitably inflated, as judged by feel, the operator slightly pinches the internal plug after withdrawing the needle. In this way the vent is permanently closed.

### Bat Balls

Vacuum process hollow balls are converted into bat balls by venting the walls. Such a ball has much less rebounding quality than an inflated ball. It is used as a return ball by attaching a bit of elastic rubber thread in the hole. It thus obtains its rebounding effect in action from the stretching of the thread held by the player.

### Boring Bat Balls

A very effective hopper-fed ball-boring machine is used for producing bat balls. It bores automatically 85 a minute. The hole is made by a fish-hook cutter and die, illustrated in Fig. 4. As a ball comes into position for cutting, it is pierced by a pointed spindle or cutter operating through a tubular die which follows it downward. As the spindle withdraws into the die on the upward stroke, its annular fish-hook cutting edge makes a circular vent in the ball.

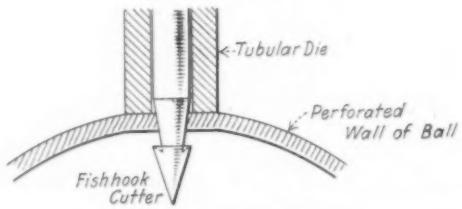



**Fig. 4—Ball Boring Tool**

# Rubber Glass — A New Product of Great Interest

THE legend of the king who executed a subject for making flexible glass and thus outraging nature's laws, is brought into the modern mind by the production of perfectly transparent rubber. Nor is the inventor, Mr. Fordyce Jones, a well-known British rubber man, the object of royal displeasure or church censure because of his really marvelous product. At the outset it should be understood that the material, while it is translucent, differs from actual glass in certain notable particulars. So far it is soft rubber and not hard rubber glass. In other words, it does not possess rigidity. Possibly that may be attained by further research.

Tumblers and drinking cups have long been made of white rubber. So, too, have bottles. But they do not compete with glass tumblers and glass bottles. The fact that they may now be made transparent will hardly make much difference, as flexible goods in this line are not desirable. Then too, the cost of production is to be considered. Sand is a far cheaper basic material than is rubber. Moreover, while glass shows great wastage through breaking, it does not oxidize and perish, as transparent rubber is likely to do.

The uses, at first apparently many, on analysis prove actually few. They are, however, important. In clothing and notions an invisible, waterproof coating for fine fabrics, preserving colors, luster, patterns, and texture, opens a most alluring field. In the line of druggists' and surgeons' sundries also, there are many specialties that, if actually transparent, will be far more useful and salable. For example, transparent nipples are likely to appear more cleanly than others. It is possible also that transparent tobacco pouches might appeal to the pipe smoker.

Possibly the seven years of bad luck said to follow the breaking of a mirror may be done away with by a plate of rubber glass backed with tinfoil and quicksilver and suitably framed. A translucent bathing cap revealing the color and texture of the tresses beneath is likely to be popular.

Faultfinders might welcome the prospect of dwelling in houses having rubber glass windows, so that they might throw stones with impunity, but it is safe to say that panes of such material would not be practical. Sunlight in passing through would doubtless render the rubber short-lived. Fire insurance companies would surely condemn so inflammable a material. Burglars would doubtless favor such panes as affording quiet and easy access to window locks.

And yet, while fire insurance companies might not take kindly to rubber window panes, accident and plate glass insurance concerns, on the other hand, could scarcely fail to see in them an advantage, sometimes one of great proportions. In this connection might be recalled the Black Tom explosion on a railroad pier in New York Harbor, July 30, 1916, killing a score of people, damaging property to the extent of $20,000,000, much of the latter representing shattered window glass in lower New York City. In Halifax, Nova Scotia, December 6, 1917, the munition ship "Mont Blanc" exploded with such awful force that not only was the city half destroyed but 1,266 were killed and 400 were blinded by flying glass. Had the window panes been of less brittle material it is certain the suffering would have been very much less.

When it comes to automobile windshields and windows, those who fear glass splinters will undoubtedly vote for rubber glass. Railway carriages, including street cars, could also be made safer in this perhaps minor particular.

In the toy line the new material is likely to have a profitable field. Toy balloons so filmy that they appear to be floating bubbles could easily be made. So, too, many novelties in balls and dolls. A suggestion in ladies' footwear is a dainty, unlined rubber shoe that would show the shoe over which it is worn, and, while waterproof, be practically invisible.

Just what may be done in optics with rubber glass is a problem for the scientist, and it may even involve the baffling task of transmuting the properties of the caoutchouc colloid into the silicious crystalloid, or vice versa. Non-fragile eye-glasses, field and opera-glasses, and telescopes, great and small, may utilize rubber glass. Of course, there are mechanical difficulties in the way, but if necessary they will be overcome.

Certainly it is curious to speculate upon the possibilities of varying the focal length of lenses by utilizing hollow, part-sphere sections of rubber glass united at their edges, yet admitting of

distension or reduction of convexity at will by the introduction or withdrawal of water or other liquid from such container. Some strange and valuable effects might be thus produced in telescopic work on a great scale; and if refraction comparable to that of glass could be obtained, it might lead to the construction of a lens even much larger than that of the 40-inch objective at the Yerkes Observatory in Illinois.

Transparent rubber might also be valuable in clinical use. In order to determine how a wound is healing it is often necessary to completely remove a bandage, occasioning loss of time to doctors and nurses and frequently discomfort to a patient. But with the latter wearing a perfectly pellucid plaster or a diaphanous dressing a removal might often be obviated as changes, in at least superficial lesions, could easily be observed through the transparent bandage material.

Celluloid is too hard, too brittle, and too inflammable for many theatrical uses, and masters of properties, especially in motion picture studios, have often sought for something akin to rubber glass. An immense business is done in general photographic films and celluloid ribbon for the "movies," and rubber-glass makers might get a fair share of this profitable trade.

A close approach to transparent rubber has been achieved by Dr. Rudolph Ditmar, of Graz, Germany, in the recent production of rubber celluloid. For years chemists have sought to intimately combine caoutchouc and xylonite but have been unable to get a fluid which would readily absorb both substances and into which they could be homogeneously mixed. Dr. Ditmar says that in reduction products of naphthaline and phenol the suitable mutual solvent has been found. Immersed in hexalin (cyclohexanol), celluloid or cellon is kneaded to a dough, and in a separate mixer smoked sheet or crêpe rubber is treated with the same chemical in the same manner. In a third apparatus the two viscid compounds are worked up into a uniform solution. When the latter is spread on glass sheets and the solvent evaporated the result is a film that is transparent and elastic and flexible. By modifying the proportions of the celluloid and the rubber, it is claimed, photographic and cinematographic films of a superior kind can be easily produced, not to mention a wide range of other articles of considerable commercial importance.

A sheet of celluloid compressed between two panes of glass has yielded a bullet-proof glass. Perhaps a sheet of transparent, colorless rubber thus imbedded in the place of xylonite would give an equally unshatterable glass for numerous needs.

The poorest churches might have "stained glass" windows that might vie in artistic effects with the real articles in wealthy cathedrals if tinted sheets of rubber glass in leaded, mosaic, or shaded designs were provided for easy cementing to the plain panes. There seems to be no reason why rubber-glass could not be made to give richer effects than the colored gelatine paper material ordinarily used as a stained glass substitute, and it should be more durable and cost but little more.

THE INDIA RUBBER WORLD has already told of rubber roses and millinery ornaments. Possibly, in making these artificial blooms, transparent rubber may be utilized to heighten the naturalistic effect. For schools and museums flowers, insects, or other natural history specimens might easily be imbedded in sheets of rubber glass, especially since vulcanization can be done, as by the Peachey process, without heat, pressure, or impairment of color or clarity. In the framing of pictures objection is often made to the light-reflecting glass. For many pictures a sheet of rubber glass might make an ideal covering, and one to withstand rough handling by moving-van men or falls while being hung.

Still, despite the many excellent uses that may be found for the new and interesting material, its advent is not likely to mark a revolution in the industrial art; nor is it probable that the ancient product, still largely made of silica sand with soda or potash, will suffer any early eclipse.

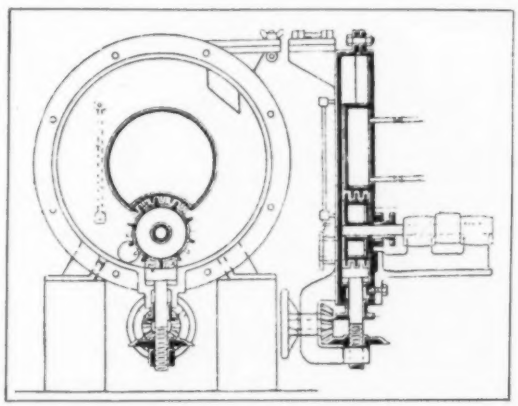
## Plauson Colloid Mill[1]

A so-called "colloid mill" has been invented in Germany by Hermann Plauson. The machine consists of a grinding device in which the material is to be reduced to the colloidal state by mechanical disintegration. The machine is made in two types; one is the impact and the other the friction type. The first is a form of rotating mill consisting of a round compartment in which a toothed wheel revolves eccentrically.

There is a central water-cooled drum with a concave toothed cavity on the lower side and having teeth so arranged that the teeth of the wheel may pass between them. The speed of the wheel is about 9,000 turns per minute and the shock on the material under treatment is concentrated at one point instead of being distributed as in other grinding mills. In the friction type of mill a shearing action is exerted upon the material by passing it suspended in water between two hardened steel plates revolving in opposite directions.

The method of grinding consists in treating 30 parts of the material with 70 parts of dispersion medium in the mill for a suitable length of time, then diluting with more of the medium, settling for various periods up to 12 hours, and returning the sludge to the mill for retreatment.

The colloid mill has various applications in the field of oil extraction, preparation of liquid coal, suspension of 40 to 45 per cent



**Plauson Colloid Mill**

of coal in fuel oil, and for other purposes, including the manufacture of lampblack from charcoal and the preparation of all sorts of materials to the colloidal state to improve their value as compounding ingredients and as pigments in mixtures of various sorts. The advantages of colloidal material in rubber mixing are very important. They include greater homogeneity of stock; acceleration of vulcanization; increase of absorption of filling material by the rubber; increase of coloring effect of pigments, etc.

### Summary

The invention of the colloid mill renders possible a number of very important advantages in the industry over present rubber manufacturing practice, due to rendering available compounding ingredients in a state of colloidal fineness. These advantages may be summarized as follows: (1) production of a homogeneous mixture, (2) acceleration of vulcanization, (3) possibility of increasing the weight-compounding capacity of rubber, (4) increase of elasticity, (5) intensifying the coloring effects of pigments, (6) production of smoother surface on goods, (7) increased rate and greater absorption of sulphur, avoiding efflorescence or "blooming," (8) better reclaiming of vulcanized scrap rubber, (9) production of colloidal hard rubber dust of superior insulating qualities.

[1]Chemiker-Zeitung, 44, 553-5.

# A Glossary of Words and Terms Used in the Rubber Industry—XIV[1]

## Pneumatic Tires—Additional Definitions[2]

By Henry C. Pearson

F. A. S. ("Free alongside ship.") An American export trade term referring to the delivery of goods at a price stated free alongside an overseas vessel and convenient to loading tackle.

F. O. B. ("Free on board.") A commercial term meaning that for the price quoted, the seller agrees without extra charge to put goods "free on board," or in cars or lighters of the railroad serving the seller.

FABRIC FLAP. A loose strip made of layers of rubberized tire fabric, endless or with lapped, tapered ends, each type having skived edges and a perforation for the tire valve, placed in a casing above the beads to cushion the inner tube and protect it from rim rust, bead pinching, etc. Sometimes the surface of the flap next to the tube has a canton flannel or other soft cloth lining to lessen friction. See Floating Flap.

FALSE BEADS. Bead rings used to make a straightside tire fit a clincher rim or a clincher tire fit a straightside rim.

FEATHERING. Buffing, grinding, shaving, or beveling gradually to a thin edge to insure a better union in repair curing of old or applied rubber, or to avoid kinking, hinging, etc., as in a fabric or floating flap. See Fabric Flap, Feather Edge, Floating Flap, Grinding Down, Skiving.

FILLER STRIP. A light, frictioned fabric strip placed on the heel and under side of a bead before applying the chafing strip.

FILLERS. (1) Various accessories as reliners, interliners, flaps, blowout patches, etc., put inside a tire. (2) Filler compounds. See Filler Compounds.

FIRST OPERATION. The primary process in a combination cure, in which the carcass, after the plies of fabric have been superposed, the beads placed, and the sidewalls applied, is semivulcanized on the building core. Sometimes the cushion and breaker are also put on and cured in the first operation. See Combination Cure, Second Operation.

FLAP ESSENTIALS. Requisites of a correctly-designed fabric or other flap, properly applied in a casing, to insure utmost protection to and fullest service from an inner tube. The flap should reach to a point on the inside of the casing about even with the top of the rim flanges. If the flap be so wide that the edges come above this point the flap edges may cut into the casing with the tube following, resulting in serious injury to the tire. If the flap be too narrow one or both edges may fold under when the tire is put on the rim, causing tube pinching. A flap should provide a suitable seating for an inner tube and aid in taking up inflation pressure or other stress imposed on the tube. Manufacturers supply flaps to fit each size of tire on every size of rim on which the tire can be used, as a 33 by 4 tire requires a different width of flap when used on a 32 by 3½ rim—which is 2.312 inches wide—than when used on a 33 by 4 rim—which is 2.688 inches wide.

FLOW. To run readily, as a liquid; to melt so as to impart freedom of motion to particles in a substance; to become viscous and capable of conforming to a mold and fusing with or adhering to contiguous material, as raw rubber or rubber compound when heated to vulcanizing temperature. Such flow of rubber is modified by and conditioned upon the amount and duration of temperature and pressure, upon the kind and complexity of the compounding ingredients, and upon the mass, density, and partial insulation—as in rubberized fabrics—of the material. Rubber flows at 195 degrees F. See Curing, Curing Scale, Vulcanization.

FOLDING ENDURANCE. The capacity of a fabric to withstand rapid and long-repeated doubling and reverse lapping upon itself without deterioration, as distortion of texture, disintegration of fiber, etc. Tests for folding endurance are made with apparatus, and determine flexibility and incidentally strength of a fabric.

FREEZING. Adhesion of a tire to a rim, commonly through rusting of the latter. Prevented with graphite or rim paint. See Graphite, Rim Paint.

FRICTION. To force rubber into the meshes of tire fabric from one or both sides; ordinarily effected with a three-roll calender, the middle or drive roll of which runs faster than the roll above and the roll below. The upper and lower rolls are kept very hot while the center one is kept somewhat cooler. The fabric is run through the calender from the rear and passes between the middle and bottom rolls where it meets a revolving "bank" or mass of warmed rubber, which is pressed into the fabric as a single frictioning. For a double frictioning the treated fabric, rolled up in front of the calender, is again taken to the rear and passed between the middle and bottom rolls but with the fabric surfaces reversed.

FRICTIONAL HEAT. Heat developed by the rubbing together of threads in a square-woven fabric, or cords in a cord fabric, or by plies of fabric or layers of cords thus rubbing together, burning and disintegrating the rubber friction in the fabric plies or the rubber insulation around the cords; a common cause of blowouts and other tire troubles.

FULL FLOATING STOCK. Inner tube gum of low specific gravity, which does not sink in water, and has a maximum of pure rubber.

GAGING, GAUGING. Indicating with marks the parts of a tread or sidewall to be cut for tread, sidewall, or section repairs.

GAS. A colloquialism for gasoline. See Gasoline.

GAS CURING TEST. A simple method of determining the thoroughness of the cure of a sectional repair by applying a small amount of gasoline to the innermost ply of a casing. If the casing has been vulcanized throughout, the cement or friction will be unaffected by the gasoline; if not, it can be easily rubbed off the material touched with the solvent. See Curing, Vulcanization.

GASOLINE. (Gas.) Petroleum spirit, petrol (British). A volatile, inflammable fluid of complex hydrocarbon formula, of low specific gravity (.66 to .69) and with a boiling point from 122 to 300 degrees F., distilled from petroleum; used as an illuminant, detergent, fuel (especially for internal-combustion engines), and as an oil and rubber solvent. Besides being employed for spreading (waterproofing textiles) and for making dipped goods, it is extensively used in tire repair work for removing bloom from rubber and grease from casings and tubes, and in the making or thinning of dough (tire putty) and rubber cement (solution). For the latter purpose only high-test or casing-head gasoline, which leaves no grease spots on white paper after evaporation, is recommended, as any oil content or "high boiling residues" would lessen adhesion of rubber or compound. It is sometimes called light or petroleum naphtha, and is also classed with petroleum ether (specific gravity .65 to .66). See Bloom, Dough, Solution.

GRAPHITE. A soft, native form of carbon of black color and metallic luster. Called also plumbago and black lead. Specific gravity 2.09 to 2.23. It is produced artificially by passing an alternating current through granular anthracite. A valuable lubricant used to "soften" rubber compounds or make them "slippery"; to keep sand from caking and to enable sand bags to afford uniform pressure in vulcanizing; mixed with paraffine to keep repairs from sticking to molds; and when mixed with rubber solution to prevent

[1] Continued from THE INDIA RUBBER WORLD, April 1, 1922, pages 483-485.
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tires freezing to rims. See Freezing, Rim Paint, Sand Bags.

GRAPHITED TUBES. Inner tubes into the exterior of which graphite is vulcanized to prevent the tube sticking to the casing.

GREEN STOCK. Raw, crude, or unvulcanized rubber; uncompounded gum.

GRINDING DOWN. A repair term. Skiving or tapering with a rasp or emery wheel the rim of a hole in a tube, or the edges of other repairs in tubes or tires, to obtain better adhesion of cement, better union between old and new rubber, overcome a tendency of a repair to form a hinge, and for the removal of surplus cured gum on the surface of a repair.

GROMMET BEAD. A cable bead. So called because of its grommet or ring-shaped, rope-like structure. See Cable Bead.

GUM STRIPPING. Covering the raw edges of plies in repair with narrow strips of cushion gum to secure a stronger bond in curing.

HAND-WRAPPED. Wound about or cross-wrapped by hand with a continuous strip of cotton taping. Said of a built-up casing thus prepared for pressure in vulcanizing in a tire heater. See Heater Cure, Wrapped Process.

HEAT CLOTHS. Pieces of strong cotton sheeting applied wet and used in repair to prevent burning, to hold gum in place, to retain soapstone paste in non-skid designs, or used in strips for building up low spots, underlaying long cloths, or in wrapping tires for pressure in kettle curing.

HEATER CURE. The vulcanizing of a built-up casing, usually cross-wrapped, in a heater or kettle in which not only the heat required for curing but also much of the needed pressure is afforded by live steam. See Open Cure, Wrapped Process.

HEAVY DUTY CUSHION STOCK. Cushion gum of extra thickness often used on truck pneumatic tires.

HEAVY DUTY TIRE. A pneumatic tire of extra strength for trucks and omnibuses; made largely of light-weight cord fabric in 7, 8 and 9-inch cross-section sizes and with 10, 12, and 14 plies, respectively.

HINGE. (1) That part of a casing at which it bends or deflects from normal contour in lessening the distance between rim and road; the flexing point in a tire, roughly stated as midway between bead and tread, but may be higher or lower according to the construction of the tire. A hinge is accentuated by load increase and underinflation and may cause severe frictional heat and disintegration of rubber, and, by interrubbing of threads, occasion a rupture in fabric and a blowout. (2) A trouble sometimes following a sectional repair or an inside reinforcement, due to improper beveling or feather-edging of a fabric injury, or to the insertion of a fabric of a gage higher or lower than that of the fabric in the remainder of the casing.

INFLATION SCALE (AUTOMOBILES). A table showing the pressure required in various sizes of tires to safely sustain varying loads of passenger and commercial motor vehicles, a typical schedule being as follows:

AUTOMOBILE INFLATION SCALE

| Size | Inflation Required Pounds | Load per Tire: Rear Wheel | Load per Tire: Front Wheel | Size | Inflation Required Pounds | Load per Tire: Rear Wheel | Load per Tire: Front Wheel |
|---|---|---|---|---|---|---|---|
| 28x3 | 60 | 350 | 450 | 32x4½ | 90 | 850 | 1,000 |
| 30x3 | 60 | 375 | 475 | 33x4½ | 90 | 875 | 1,050 |
| 32x3 | 60 | 375 | 475 | 34x4½ | 90 | 900 | 1,100 |
| | | | | 35x4½ | 90 | 950 | 1,150 |
| | | | | 36x4½ | 90 | 1,000 | 1,200 |
| 29x3½ | 70 | 450 | 550 | 37x4½ | 90 | 1,050 | 1,250 |
| 30x3½ | 70 | 475 | 575 | 38x4½ | 90 | 1,100 | 1,300 |
| 31x3½ | 70 | 500 | 600 | 40x4½ | 90 | 1,200 | 1,400 |
| 32x3½ | 70 | 525 | 625 | 41x4½ | 90 | 1,300 | 1,500 |
| 33x3½ | 70 | 550 | 650 | | | | |
| 34x3½ | 70 | 575 | 675 | | | | |
| 36x3½ | 70 | 625 | 700 | 34x5 | 100 | 1,000 | 1,250 |
| | | | | 35x5 | 100 | 1,050 | 1,300 |
| | | | | 36x5 | 100 | 1,100 | 1,350 |
| 30x4 | 80 | 550 | 700 | 37x5 | 100 | 1,150 | 1,400 |
| 31x4 | 80 | 575 | 725 | 39x5 | 100 | 1,250 | 1,500 |
| 32x4 | 80 | 600 | 750 | | | | |
| 33x4 | 80 | 625 | 775 | | | | |
| 34x4 | 80 | 650 | 800 | 37x5½ | 110 | 1,300 | 1,550 |
| 35x4 | 80 | 675 | 825 | 38x5½ | 110 | 1,350 | 1,600 |
| 36x4 | 80 | 700 | 850 | | | | |
| 37x4 | 80 | 725 | 875 | 36x6 | 115 | 1,400 | 1,750 |
| 40x4 | 80 | 800 | 950 | 38x6 | 115 | 1,500 | 1,900 |
| 42x4 | 80 | 850 | 1,000 | | | | |

Cord tires are usually inflated 5 pounds less than corresponding sizes of fabric tires on account of having larger air capacity.

MOTORCYCLE INFLATION SCALE

| Regular Tires: Size | Regular Tires: Inflation Required Pounds | Racing Tires: Size | Racing Tires: Inflation Required Pounds | |
|---|---|---|---|---|
| 2¼ inches | 30 | 1¾ inches | 45 | when cool |
| 2½ " | 32 | 2 " | 50 | " " |
| 2¾ " | 35 | 2¼ " | 55 | " " |
| 3 " | 40 | | | |

TRUCK CORD TIRE INFLATION SCALE

| Size | Inflation Required Pounds | Wheel Load Pounds | Size | Inflation Required Pounds | Wheel Load Pounds |
|---|---|---|---|---|---|
| 4 | 70 | 990 | 7 | 110 | 3,000 |
| 4½ | 80 | 1,280 | 8 | 120 | 4,000 |
| 5 | 90 | 1,700 | 9 | 130 | 5,000 |
| 6 | 100 | 2,200 | 10 | 140 | 6,000 |

INTERMEDIATE STRIP. A strip of gum of similar quality to breaker friction gum placed at either side of a breaker to take up the shocks not absorbed by the breaker.

INTERNAL EXPANSION CURE. A process of vulcanizing casings in which, after the carcass has been built and cushion and tread applied on a collapsible core, the core is removed and a heavy, circular, rubberized fabric bag is put in its place. The bag is filled with water heated to vulcanizing temperature and a pressure of 200 pounds to the square inch is applied inside the tire while the latter is set in the curing mold.

JACKET. A strip of cotton cloth from 12 to 20 inches wide, wrapped longitudinally about a tire to be cured in open steam. See Open Cure, Wrapped Process.

JUNIOR CORD. A trade term for a cord tire for small rims, which, instead of being oversize, has the same measurements as a regular fabric tire. Junior cords have been made in 30 by 3½ size to be used with or to take the place of 30 by 3½ fabric casings, but the manufacture of them has been discontinued in favor of the heavier, oversize cord tire. See Cord, Fabric Tire, Oversize.

## DEVELOPMENT OF AMERICAN ZINC OXIDE

During recent years the history of the American Zinc, Lead & Smelting Co. has been one of continuous development, while, during the first three months of 1922, sales of Azo zinc oxides, one of the company's products, have, it is said, broken all previous records

The establishment by this organization, some six years ago, of a plant at Hillsboro, Illinois, to manufacture zinc oxide, was followed in January, 1921, by the opening of another factory at Columbus, Ohio, with a view to supplying the company's eastern trade. Recently additional equipment, doubling the production of this newer plant, has been put in operation, this being the second expansion of the company's operating facilities during the year. Thoroughly modern machinery and the most improved metallurgical appliances have been installed, while the strategical location of the Columbus plant has been an important factor in its success. As the organization controls important mining properties, there are promising indications for future development and trade. L. E. Wemple is manager of The American Zinc Sales Co., one of the concern's subsidiaries.

## TIRE AND RIM ASSOCIATION MAKES CHANGES IN MOTOR TRUCK RIMS

According to a statement recently issued by the Tire and Rim Association, 535-7 Leader-News Building, Cleveland, Ohio, rims measuring 33 by 4½ inches are to be eliminated in the future as original equipment for motor trucks. The 31 by 4-inch straightside rim, however, has been added to the standard lineup, the rim keeping the present 4-inch contour. The diameter of the new type constitutes the only difference, as compared with preceding models.

## Judicial Decisions

SHOEMAKER AND BRUCK VS. HUNTINGTON. Court of Appeals of the District of Columbia. No. 1432. Decided January 3, 1922.

An appeal from a decision of the Patent Office in an interference proceeding in which priority of invention was awarded Huntington, whose application was not filed until after the issuance of a patent to Shoemaker and Bruck. The invention relates to rubber shoe taps or half soles, with a shank edge reinforced by a fabric strip to prevent withdrawal of the nails.

The Examiner of Interferences, who found for the appellants, and all the tribunals also recognized that Shoemaker and Bruck, prior to the entry of Huntington into the field, "had the idea broadly of reinforcing the half sole on the rear edge thereof."

The court held that Huntington did not sustain the heavy burden resting upon him and reversed the decision appealed from and awarded priority to Shoemaker and Bruck.—*Official Gazette*, March 14, 1922, Volume 296, No. 2, page 455.

BAUMGARDNER VS. HUDSON. Court of Appeals of the District of Columbia. No. 1428. Decided January 3, 1922.

The appellant Baumgardner applied for patents for paint and ink containing ground oyster shell as a filler in the place of white lead and aluminum hydrate, respectively. He employed Hudson as his attorney and assigned one-half of his interest to Hudson and a man named Hoyt, thus making Hudson both attorney and business associate.

Baumgardner had prepared a sample of rubber solution containing ground oyster shell as a substitute for zinc oxide and told Hudson about it while the latter was acting as his attorney.

Hudson subsequently applied for a patent on a similar idea, claiming it had been suggested to him by a lecture he had heard. The Board of Examiners in Chief were of opinion that "the two ideas of use are entirely different and knowledge of one is not suggestive of the other." But on the interference the court disagreed with the above, stating as its opinion that the information Hudson derived from the appellant Baumgardner suggested the idea he sought to patent. The court added: "An attorney cannot avail himself of information thus acquired to the damage of his client, though the relation of attorney and client has ceased."

The decision of the Commissioner of Patents was reversed.—*Official Gazette*, March 28, 1922, Volume 296, No. 4, page 837.

THE PHILADELPHIA RUBBER WORKS CO. VS. UNITED STATES RUBBER RECLAIMING WORKS, UNITED STATES RUBBER RECLAIMING CO., INC., and MADISON TIRE & RUBBER C., INC. United States District Court, New York.

The long-contested litigation between the Philadelphia Rubber Works Co. and the United States Rubber Reclaiming Co., Inc., over the Marks patent has finally been settled.

The court held that the defendants' product essentially derived its marketabilty and value from the unlawful appropriation of the Marks process. The court further held that this was not a wilful and deliberate infringement. In view of the history of the litigation, it was considered undesirable and inequitable to impose an interest charge on the award from the date of infringement; therefore interest was allowed only from the date of the decree.—*Federal Reporter*, Volume 276, page 600.

### The Marks Patent

United States patent No. 635,141, October 17, 1899, was granted to Arthur H. Marks for a process of reclaiming rubber from vulcanized rubber waste by the use of alkali. The Marks patent has been owned successively by the Diamond Rubber Co., The B. F. Goodrich Co., and The Alkali Rubber Co. It was finally acquired by The Philadelphia Rubber Works Co. when that company consolidated with the Alkali company.

There are two basic methods which have been employed for devulcanizing rubber. One, the acid process, consists in grinding the rubber, subjecting it to a dilute solution of sulphuric acid at a temperature above the boiling point of the solution, and continuing this treatment until the destruction of the cotton fiber that may have been in the scrap is completed. The mass is thereupon washed until the acid has been completely removed. It is subsequently placed in a devulcanizer and subjected to the action of live steam at a pressure of approximately one hundred pounds for a period of approximately twenty-four hours. The other method is the alkali process of Marks and consists in submerging the scrap rubber in a finely ground condition in a dilute alkali solution in a digester, provided with a steam jacket. Subsequently, live steam under a gage pressure of approximately one hundred and twenty-five pounds is introduced into the jacket surrounding the digester, thus heating the contents of the digester. The digester is provided with a stirring device in order that its contents may be kept under agitation. The heat treatment continues for about twenty hours.

## Treasury Decisions

**Regulations 47 (Revised December, 1921) Relating to The Excise Taxes on Sales by the Manufacturer under Sections 900 and 904 of Title IX of the Revenue Act of 1921.**

Provisions regarding taxes payable by a manufacturer on all sales made directly by him or through an agent include certain specifications especially applicable to automobile or tire manufacturers. The following statement in this connection as prepared under the Revenue Act must be strictly adhered to by the manufacturer:

FORM OF CERTIFICATE

The undersigned hereby certifies that he is a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts, or accessories, and that the tires, inner tubes, parts, or accessories purchased hereunder are purchased by him as such a manufacturer or producer for resale in some form or manner or for free replacement under contract or guaranty and agrees if any of the tires, inner tubes, parts or accessories are sold by him exempt from tax to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories for like purposes he will require a similar certificate from such manufacturer or producer. The undersigned further agrees that in respect to all tires, inner tubes, parts, or accessories sold by him, unless such sale is made to such a manufacturer or producer, he will pay the tax on such sale direct to the internal-revenue collector, including it in his tax return covering the month in which such sale is made; said tax to be paid on the basis of the taxpayer's selling price of such articles when sold other than on or in connection with the sale of new automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts, or accessories, and on the selling price of such vehicles or articles when the same includes such articles.

Regulations concerning automobile trucks and automobile wagons, other automobiles and motorcycles are as follows:

Any tires, inner tubes, parts, or accessories for automobile trucks and automobile wagons sold on or in connection therewith or with the sale thereof are taxable at 3 per cent as part of the selling price of the automobile truck or automobile wagon. This applies only to such tires, inner tubes, parts, or accessories as are not in excess of the quantities usually sold in the ordinary course of trade to a single customer at the time and in connection with the sale of an automobile truck or an automobile wagon. Any quantity of tires, inner tubes, parts, or accessories in excess of this amount is taxable under subdivision (3) at 5 per cent of the selling price thereof.

Tires, inner tubes, parts and accessories for other automobiles and motorcycles sold on or in connection therewith or with the sale thereof or separately are taxable at 5 per cent.

It is also especially stated that unvulcanized sheet rubber, liquid rubber vulcanizing cement, and friction fabrics are considered raw materials, and are exempt from tax.—*Supplement to Treasury Decisions* (T. D. 3278), Treasury Department, United States Internal Revenue.

# Budding and Marcottage of Hevea[1]

## Propagation by Bud-Grafting Has Advantages Over That by Seed Selection—Conditions for Successful Operation

### Budding

In the first place the mother tree from which the buds to be grafted are to be taken must fulfil the following conditions: It must belong to a small number of the best producers; be as young as possible and in full growth; be among the best developed trees in the plantation and free of diseases, and especially it must never have had brown bast. In order to get a correct estimate of the character of the mother tree as far as yield is concerned, monthly measurements of the yield of each tree must be registered for at least two years. If tapping is begun when trees are four years old and measuring is begun a year later, two years later seven-year-old mother trees in their prime will be had. A mother tree yields from 500 to 2,000 buds; on an average, 1,000 per tree. If we calculate 60 per cent of successes, then each tree will yield enough planting material for 5 acres planted with 120 trees per acre. The branches best suited for bud wood are those that are highest and grow in the full light. The branches should be removed after a tree has wintered and the tree should then be given a rest of from 3 to 4 months during which time it is not tapped. The branches should be cut into lengths of about 80 cm.[2] and placed in kerosene tins filled to a depth of 10 cm. with water. Bud wood can be kept for as long as thirty days if properly packed in sawdust saturated with water. The branches should peel easily.

Inserting the Bud in the Wound in the Stem, Which Is Then Bandaged With Cheese-Cloth

The best stock for bud grafting is that which is as young as possible; seedlings that are just thick enough to permit the operation give the best results. As a general rule seedlings from 5½ months to a year old may be used. Young trees up to two years old may also be used but the chances for success are less. For these trees, the thicker branches about 8 cm. in circumference should be used. The seed for raising seedlings should preferably be plucked from healthy, well-grown trees, when ripe. The nursery beds should be carefully prepared so as to insure the growth of healthy young stock.

The only tool necessary is a strong keen knife and Mr. Donkersloot found that an American knife known as "Keen Kutter Kotton Knife" served his purpose very well. A yellow paraffine, obtained from the Dordtsche Petroleum Maatschappij, was used for waxing cheese-cloth which was afterward torn into strips varying from one-half yard to one yard in length according to the age of the stock.

Budding Opened After 20 Days—The Bast Lip Is Cut Off—The Grafting Knife Is Here Shown, Too

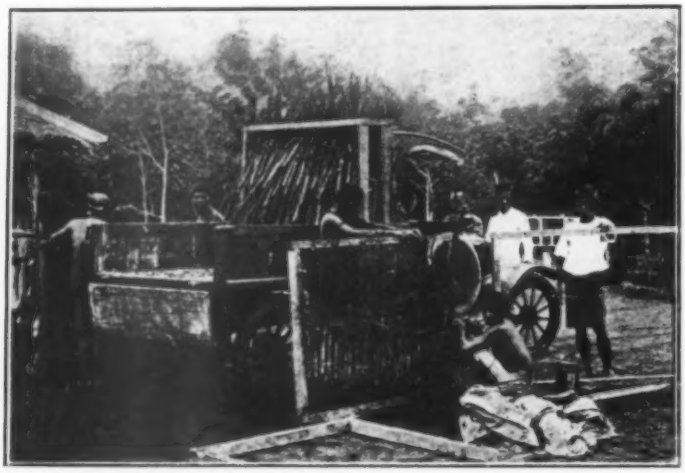
Two vertical cuts, slightly longer than the length of the bud patch, are made in the bark of the stem of the stock, as close to the ground as possible. The bud patch is cut with a bit of wood adhering to the bark and this must first carefully be removed with the tip of the knife. The buds are always situated immediately above a leaf scar and coolies should be taught that this scar is at the bottom of the bud so that when the patches are put in position they may not be put in wrong side up, which would result in a crooked growth of the new shoot. Now a horizontal cut is made on the bark of the stock connecting the upper points of the two vertical cuts previously made; the bark is then deftly lifted with the hands and the bud patch quickly and firmly placed against the wound; the loose tongue of bark is then drawn over it and the whole bandaged with the waxed cloth. The order of procedure is necessary to prevent the latex which exudes from the cuts on the stock from flowing over the exposed cambium and hindering a proper union of stock and bud patch.

Plant Beds After Buddings Have Been Made

[1]By F. W. Donkersloot in the Archief voor de Rubbercultuur in Nederlandsch-Indië, November, 1921.

[2]Centimeter is 1/100 of a meter. Meter equals 39.37 inches.

The bud patch should always be slightly smaller than the wound which has been cut on the stem of the stock in order to leave an outlet for the latex that is pressed out when the bud patch is put in position. Budding should not be undertaken when it rains.



**Mounting Racks Used for Transplanting Buddings**

Twenty days after the budding, the bandage may be removed and the loose strip of bark cut off. Ten days later, that is thirty days after budding, successful stocks are cut down to a foot above the bud. The bark immediately above and below the bud is scratched with the point of a knife. If the bast underneath is green, the budding has been a success, if brown and dry, it has failed and budding may be renewed on the opposite side if the former attempt has not taken up half of the circumference of the stem. False shoots, which can be distinguished from the shoot coming from the bud because they are light to dark brown while the latter is light green, should be carefully removed. The bud will sprout after two months; some sprout as early as 14 days, while 25 per cent need six to seven months. Budded stocks should be protected from the sun by means of shades of alang-alang which can be removed 15 days after budding.

## Marcottage

For marcotting, stocks two years old and older are used. The initial process is the same as for ordinary bud grafting. When sprouted buds are a year old, they are ringed as close to the junction with the stock as possible. A bamboo basket without bottom is placed over the tree about half-way above the ringed part and the basket is filled with a light, moist and rich soil mixture. This is watered daily unless it rains. After four to five months roots are formed. As soon as enough root formation is observed, the leaves of the marcotted branch are removed and ten days later the basket is taken away and the new stem severed as close as possible under the roots. Only the strongest roots are retained and the plant is further proceeded with as for stumps.

By marcotting, therefore, grafts are made to grow on their own roots, the stock serving as a temporary feeder only.

## Costs

Coolies have to be trained about two months before they become efficient. During the first month of training the average successes of a group of eight coolies was 33 per cent. After three and one-half months, when three of the least efficient had been given other tasks, the average was 80 per cent, individual coolies getting as high as 87 per cent of successes. These results were obtained in nurseries. Budding in the field was attended with far less success chiefly because the only shade was provided by little shades of alang-alang. When obi kajoe was grown for shade the percentage of successes was found to equal that of budding in nursery beds. An efficient coolie can bud about 200 stocks a day.

The costs worked out as follows:

| | | Gilders | Gilders |
|---|---|---|---|
| | **1. TRAINING PERIOD OF TWO MONTHS** | | |
| 3 | overseers at 50 gilders[3] per month | 300 | ... |
| 30 | coolies at 1 gilder a day (This includes loss on rice, recruiting costs, etc.) | 1,830 | ... |
| | Material, calculating 100 strips per coolie per day for 50 working days—enough for 150,000 buddings | 900 | ... |
| | Probable success 25 per cent. Therefore: | | |
| 37,500 | successful buddings, cost | ... | 3,030 |
| | **2. BUDDING PERIOD, SIX MONTHS OR 133 DAYS** | | |
| 3 | overseers at 50 gilders a month | 900 | ... |
| 20 | coolies at 1 gilder a day | 3,660 | ... |
| | Average bonus 15 gilders per coolie per month | 1,800 | ... |
| 10 | coolies for different tasks | 1,830 | ... |
| | Material: 5,000 strips per coolie per month | 3,600 | ... |
| | 600,000 buddings; average successes 60 per cent, or | | |
| 360,000 | successful buddings, cost | | 11,790 |
| 397,500 | successful buddings, total cost | | 14,820 |

[3]Gilder equals $0.40 normal United States currency.

The price per budding therefore works out at 3¾ gilder-cents, or 375 gilders per 100 acres.

The advantage of budding over seed selection lies in the fact that Hevea is adapted for cross-fertilization so that seeds of a high-yielding mother tree will not necessarily give trees inheriting the character of the mother tree. When once a successful plantation of budded trees has been brought to maturity, seeds will be obtained which will be much more reliable than those taken from selected trees in the ordinary plantation. The only real disadvantage of the vegetative method of propagation is that by degrees the disease-resisting powers tend to diminish where this method has been carried out for a few succeeding generations. But even this can be prevented if generative propagation is resorted to for obtaining both stock and bud wood, while for the purpose of rapid reproduction the vegetative method is used.

**Transplanting Buddings—The Length of the Shoots Is What Guarantees Most Success in Transplanting**

In a general discussion of vegetative reproduction of high-yielding trees, the writer gives it as his opinion that the price of rubber will certainly be lower, but that the costs of production will be reduced to such an extent that in the end a reasonable profit will be left, even when market quotations are considerably lower than they have been.

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ACCORDING TO CONSULAR REPORTS, SWEDEN'S TRADE WITH Rumania is on the increase, a shipment of 14 carloads of Swedish galoshes having been made recently to the latter country. Imports of rubber into Sweden amounted to 1,093 tons in 1913, but during the war such supplies were to a large extent cut off, and reclaimed rubber was used as a substitute in manufacturing.

# The History of Conveying Belts—II[1]

## Developments in Handling Coal, Coke, Ore, Crushed Rock, and Vessel Loading

By Thomas Robins

IN the early days the use of belt conveyors was still very restricted. For this there were three reasons. First, the fact that what we may term "industrial quantities" were small in those days, and it was possible to handle the material with conveyors of smaller capacity and poorer wearing qualities. Second, people had not yet become acquainted with the fact that rubber is the toughest material known, and they looked on a rubber belt

**Forty-Two-Inch Conveyor Handling 750 Tons of Iron Ore Per Hour**

as too frail an article to be associated with heavy and abrasive materials. Third, the belt conveyor was composed of two finished products,—a belt and the supporting and driving machinery. The rubber man was not interested in selling machinery and the machinery manufacturer saw no great advantage in pushing the sale of a device on which fully one-half of the profit would go to some rubber manufacturer.

### First Adopted in South Africa

It was in a curious manner that the business received its first real push forward. In 1895, I had written, for a technical society, an exhaustive paper on the belt conveyor. Copies of this paper fell into the hands of the American mining engineers who were then opening up the great South African gold mines. The ore was especially abrasive and destructive to metal conveyors and it was so low in grade that it was necessary to handle it in great quantities. The belt conveyor promised a solution of the problem and perhaps mainly because these engineers were not in close touch with technical matters in this country, they did not know that the belt conveyor was still an almost untried novelty, and that over here its inventor was being turned down very hard every day of his life. But thanks to their ignorance, they ordered belt conveyors by cable and in quantities, and it was not long before engineers in this country were reading about the greatest gold mines in the world, all of which were well equipped with belt conveyors.

After that, progress was not so difficult, though every time we entered a new field we were treated like more or less harmless lunatics. For example, in order to sell a single belt conveyor to a new stone-crushing company in 1897, we were obliged to contract for the design and construction of the entire plant, consisting of crusher, elevator, screen, and stone bin. In 1898, we first attempted to sell belt conveyors to handle coal and coke in by-product coke plants, and it was not until they had been rejected many times that they were generally adopted for that purpose; our first large contract being taken in 1905 for the Solvay plants in Chicago and Milwaukee. At these plants, in order to compete with other systems, we were obliged to undertake the design and construction of large gantry bridges, which carried belt conveyors for putting the coal into storage, and grab buckets for taking it out. We were anxious to substitute belt conveyors for the steel bucket conveyors which were commonly used in large electric-generating stations, but as the owners would not split the contract we were forced to furnish the entire coal-handling plant, including the hoisting machinery and grab bucket, for getting the coal out of the boats. The first large power house in which belts were used was the Third avenue railroad station on the Harlem river. This was followed by the stations of the Interborough subway, Pennsylvania Railroad and Hudson tubes.

### The Beginning of Coal Conveying

In 1900 we entered another new field by building at Louisburg, Cape Breton, the first coal-shipping pier on which the coal was handled entirely by belts. These were the first 36-inch conveying belts made. Sixteen years later we built a pier at Baltimore on which four 60-inch belts ran side by side. Each one is over 900 feet long, between centers, and carries over 3,000 tons of coal an hour.

On this advanced engineering work we had to seek the assistance of experienced engineers. Our chief engineer since 1899 has been C. Kemble Baldwin, who has been very largely responsible for our success. When we wanted to establish the Robins-Messiter ore-bedding system, by means of which copper and other ores are mixed and reclaimed by a series of belt conveyors, we employed

**Thirty-Inch Conveyor Storing Coal by Means of Airplane Tripper**

the services of an accomplished metallurgist, and in this connection we built several devices whose designs cost us many thousands of dollars. Similarly, when we designed the first self-unloading vessel, we called to our aid the assistance of a naval architect. We met with some disappointments, but the final result has been a fleet of steamers which are able to unload a cargo of 10,000 tons of coal or stone in from four to five hours without the aid of any shore equipment. Such advances could not have been made by

[1]Continued from THE INDIA RUBBER WORLD, April 1, 1922, page 474.

any concern which was not ready to design and build supplementary devices and machinery as needed. Nor could this work have been done by any manufacturer to whom either the belt or the machinery was a "side line" receiving only a fractional part of his interest and attention. On the other hand, a thing which has done much to retard the development and use of the belt conveyor has been the willingness of certain manufacturers who, with no knowledge of the working conditions, are willing to offer and make a belt of totally unsuitable quality and construction, and who, in the hope of obtaining a share in what seems to them an attractive business, are willing to give guaranties which are entirely unreasonable. Astute purchasing agents should not be blamed for taking advantage of these people.

## Two Thousand Long Tons of Crushed Stone Hourly

Recently a belt salesman presented his card to the superintendent of a large quarry and crushing plant, and offered his goods with a guaranty that they would outwear any other belt in the market. The superintendent, after asking a question or two, offered to show the young man the kind of service that belts were performing in his plant. As they approached the crushing house an increasing sound indicated that the big crusher, one of the largest in the world, was just being started up. As they stood at the base of the huge machine watching the empty belt and waiting, the salesman used the opportunity to descant upon the excellent work which his belt had performed in carrying packages in retail department stores. Unknown to him, the first loaded car from the quarry was just then stopping overhead. It carried thirty tons of rock, some of the pieces being as large as a roll-top desk. Suddenly the car was dumped and with a crash and roar its contents tumbled into the hopper which feeds the big crusher. When the shock and thunder had ceased, the superintendent turned to speak to the salesman but discovered him running away from the building. When, after an interval, he was persuaded to return, he first picked up his hat, and then addressed the superintendent with the question, "Where was the accident?" He received the reply, "That is an accident which happens one thousand times in every twenty-four hours at this plant, and it means that this belt which carries away the product of the crusher has a practically continuous load of over two thousand long tons per hour, a large

Crushed Coal Conveyor

part of it in pieces which you couldn't lift." The managers of many similar plants meet with experiences of this kind almost every day, but they are generally more willing to receive the salesmen hospitably than to entertain their guaranties.

Sometimes, just when we were regretting that belt conveyors were not used in some new field for which we knew them to be applicable, there would turn up a man of great vision who would show us the requirements and help us to fill them. The developers of any mechanical system have little to complain of when they have enjoyed the cooperation of men like L. D. Ricketts and A. S. Dwight in the metallurgical field, or C. D. Bradley and Jones & Laughlin, at whose works are handled, respectively, the largest known tonnages of limestone and coal.

## An Open Weave Shock Absorber

It will be realized that as industrial quantities steadily increased, it was necessary to make the belts wider and stronger, and also to improve the quality of the rubber cover to resist the cutting and tearing action of the material carried, which was also constantly growing larger. We found, however, that when we made the cover of a stronger compound, its tensile strength was greater than the strength of its adhesion to the fabric. Consequently, large pieces of the cover were sometimes torn loose. For this reason the effort to produce a more economical belt by improving

Conveyor Handling Run-of-Mine Coal

the cover was temporarily a failure. The great tensile strength of the cover sometimes converted into a serious injury what would have been merely a local bruise or puncture. This, as stated, was the combined result of weak adhesion and a strong cover stock.

As it was impossible to increase the adhesion of the rubber cover to ordinary duck, I placed a layer of open woven fabric between the cover and the body of the belt. This not only strengthens the adhesion of the cover under normal conditions, but it keeps it from letting go so easily after the belt has become old and water-soaked. The construction was patented in 1908. The necessity for a tough cover stock and a belt that will hang together under severe conditions will be appreciated when it is stated that at several mines in different parts of the world belt conveyors are required to carry away the waste rock, much of which is in sharp and jagged pieces weighing over a thousand pounds. Other improvements in construction have been made from time to time as we discovered their need, and we are naturally losing no opportunity to make further advances.

## IMPORTANT AMERICAN CHALK DEPOSIT

A large deposit of genuine chalk cliffstone whiting which is claimed to be equal, if not superior, to the imported grade of chalk, has been recently located at White Cliffs, Arkansas. The property, comprising over twenty-nine hundred acres, has been purchased by the Krippendorf-Tuttle White Cliffs Products Co., recently organized, and machinery and equipment of the most modern type are now being installed at the new plant which, it is said, will be the largest of its kind.

A. Daigger & Co., importer of colors, chemicals and oils, with offices at 54 West Kinzie street, Chicago, Illinois, has been appointed sole agent and distributer, Calvin Stitt being manager.

# What the Rubber Chemists Are Doing

## The Solubility of Gases in Rubber and Rubber Stock and Effect of Solubility on Penetrability[1]

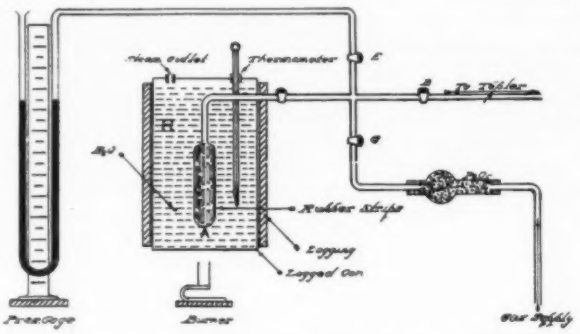
By Charles S. Venable and Tyler Fuwa[2]

RECENTLY this laboratory, in connection with an investigation undertaken for The Goodyear Tire & Rubber Co., has been making a study of the solubility of gases in rubber and rubber stock, using a direct experimental procedure capable of giving more accurate results than any hitherto published.

### Experimental Procedure

The procedure consisted essentially in leaving thin strips of rubber, from which all dissolved gas had been removed by evacuation, in contact with an atmosphere of the gas under the conditions desired until equilibrium was established. This gas was then pumped out with a Töpler pump and measured over mercury, due correction being made for the void gas in the container system used. This procedure, therefore, in contrast to those previously attempted, allows a direct determination of the volume of gas held in free condition by the rubber.

The apparatus is shown in the illustration. A weighed amount of rubber cut into thin strips was placed in the glass bulb *A*.




**Apparatus for Determining Solubility of Gas in Rubber**

Connections were made through *C* with a tube by which the gas (dried over phosphorus pentoxide or soda lime) could be introduced into the bulb. By means of stop-cock *B* connection was made with a Töpler pump and by means of *E* with a mercury manometer. A large water reservoir, *R*, around the bulb served as the means of temperature control.

After the apparatus had been carefully tested for leaks, the rubber was placed under high vacuum for 48 hours to exhaust all dissolved gases. Preliminary experiments demonstrated that for the thickness of rubber used, and at room temperature, 24 hours were required for equilibrium to be established in the case of all gases save ammonia and sulphur dioxide; and that at 100 degrees C. only 2 hours were required. A corresponding time was used for pumping out the dissolved gas. The time required for equilibrium for ammonia and sulphur dioxide was about twice that for the other gases.

### Solubility Value

To determine a solubility value, the evacuated rubber was left in contact with the dry gas under desired conditions until equilibrium was established as indicated by the constancy of the pressure in the bulb. The stop-cocks *C* and *E* were then closed and the gas (void gas and dissolved gas) in the bulb system *A, B, C, E,* was pumped out and measured. The difference between the total volume and void volume represented the dissolved gas. This quantity was calculated over to the basis of cc. gas (N.P.T.) per hundred cc. of raw rubber or in the case of the compounded samples, cc. gas (N.P.T.) per hundred cc. of rubber actually present in the mix.

### Determination of Void Volume

From gage readings, it was found that when a gas appreciably soluble in rubber is introduced into the bulb, the initial rate of solution is very rapid. Consequently, the void volume was determined by introducing hydrogen into the bulb system containing the evacuated rubber and at the end of five minutes pumping it out and measuring the gas. Gage readings during that interval had shown that the volume of hydrogen taken up by the rubber was so nearly zero as to be well within the other experimental errors involved. Confirmation of this very low solubility for hydrogen is shown by the fact that when air was introduced into the bulb system and removed after five seconds' exposure, the volume of air thus obtained is only very slightly greater than the volume of hydrogen removed after three hours' exposure to the latter gas.

### Experimental Gases

The gases used were: carbonic acid, carbonic monoxide, methane, oxygen, hydrogen, nitrogen, sulphur dioxide, ethylene, hydrogen sulphide, ammonia, and helium. The effects on the solubility of these gases in rubber were studied as regards surface exposed, pressure temperature, grade of rubber and vulcanization coefficient.

The relative solubility of the gases in vulcanized rubber was determined and compared with those in water.

### Summary

1. It has been found that when rubber absorbs a gas, this gas is, in most cases at least, held in true solution and not by adsorption.

2. In the case of carbon dioxide, which has about an average solubility, the amount of gas thus held in true solution by the rubber is, within the limits investigated, directly proportioned to the pressure and is unaffected by degree of vulcanization or the presence of compounding ingredients.

3. The solubility decreases rapidly with increasing temperature.

4. Relative solubility values obtained for various gases show that there is a general relationship, such as might be expected on purely theoretical grounds, between the solubility and the density of a gas, and its relative rate of penetration through rubber. The indications are, however, that the actual size and structure of the gas molecule and the viscosity of the rubber likewise markedly influence this rate of penetration, and in a direction which can be predicted.

[1]Presented before the Division of Rubber Chemistry at the 61st meeting of the American Chemical Society, Rochester, New York, April 26 to 29, 1921. Published as Contribution No. 38 from the Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology.

[2]Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology, Cambridge, Massachusetts.

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## Solubility of Sulphur in Rubber[1]

By C. S. Venable and C. D. Greene[2]

The degree of the solubility of free sulphur in rubber under various conditions has a practical as well as a theoretical interest. For example, this solubility is one of the two determining factors in the well-known phenomenon of "blooming." The presence of

[1]Presented before the Rubber Division at the 62nd meeting of the American Chemical Society, New York, N. Y., September, 1921.

[2]Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology. Published as contribution No. 44, from the Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology, Cambridge, Massachusetts.

an excess free sulphur unquestionably plays an important rôle in the aging of rubber goods. Furthermore, a number of theories as to the mechanism of vulcanization presuppose as the first step the melting of the sulphur and its solution in the rubber, and involve a difference in solubility of free sulphur as vulcanization proceeds.

However, in spite of these important bearings of the subject, no quantitative data have been published for the solubility of sulphur in rubber. Practically the only results recorded are those of Skellon[1] who reported on experiments made by placing together thin sheets of rubber containing different amounts of rubber and heating to the vulcanization temperature. He then analyzed for free sulphur and thus determined in which direction the sulphur had migrated. Obviously, he could thus obtain only approximate limits for sulphur solubility. According to Skellon, apparently the maximum solubility at 130-140 degrees was about 10 per cent sulphur and the solubility increased with the degree of vulcanization, a point of view which has often been taken in explaining the non-blooming of hard rubber. He did show that the sulphur distributed itself fairly rapidly through the rubber in all directions. It is known that the solubility decreases as the temperature is lowered. The foregoing represents about the extent of the published information on the subject.

In order to secure more definite information, the following investigation was carried out in connection with some cooperative work for The Goodyear Tire & Rubber Co., and is published with their kind permission. The experimental determination of these solubility figures is a rather difficult problem. The best procedure which this laboratory was able to develop did not give satisfactory results at any temperature for values of combined sulphur exceeding 7 per cent, and there is some doubt about several points obtained at the lower temperatures for values of combined sulphur less than 7 per cent. The results must therefore be considered as preliminary, but their publication appears desirable in view of the existing lack of information.

### Procedure

The procedure used was to pack in flowers of sulphur thin strips of rubber stock that had been compounded with different amounts from zero to twenty per cent of sulphur on the weight of the rubber used, and to keep the pack at the desired temperature until equilibrium was established between strip and sulphur. The samples were then analyzed for free and combined sulphur.

Equilibrium was approached from both above and below, that is, from an excess and a deficiency of original free sulphur. If the sample contains a deficiency of free sulphur, sulphur migrates in and equilibrium is fairly quickly established. On the other hand, if the original sample possesses a large excess of free sulphur, usually present as crystals within the rubber, little if any of the excess sulphur will migrate to the outside of the sheet. Consequently, all samples were given preliminary heating at 120 degrees C. to insure complete solution of the crystals before placing in the pack. It is common experience that, in the absence of crystallization centers within the rubber, a supersaturated solution forms, and the excess sulphur tends to migrate to the outside until equilibrium is approached. This short heating at 120 degrees was likewise repeated when the sample had apparently reached equilibrium to make sure that no crystallization centers had reformed within the rubber while in the pack. In either case, the equilibrium point was determined either by a constancy in weight of sample, after short intervals of heating, or better still by practical constancy in values of free sulphur upon analysis of the samples taken from time to time.

It should be emphasized that the quantities of free sulphur found by the above procedure should represent the amount held in solution by the rubber in equilibrium with solid sulphur at the same temperature; in other words, the true solubility of sulphur in rubber.

[1]Kolloid-Zeitschrift 14, 1914, page 96.

### Summary

It was found that the solubility of sulphur in rubber increases slowly with the vulcanization coefficient, this increase being more rapid as the temperature increases. It was found that when this coefficient was greater than 7 per cent combined sulphur it was impossible to obtain solubility values by the method used, due to the fact that the rubber becomes almost impermeable to free sulphur. This impermeability probably has more to do with the non-blooming of hard rubber stocks than the increased solubility of free sulphur. By extrapolating the curves obtained, it can be calculated that a stock having 4 per cent combined sulphur at 140 degrees C. will be saturated with about 15 per cent free sulphur.

## Chemical Patents

### The United States

PROCESS FOR THE MANUFACTURE OF HEXAMETHYLENE TETRAMINE. A process for the manufacture of hexamethylene tetramine, comprising oxidizing methane in the presence of ammonia.—Hermann Plauson, Hamburg, Germany. United States patent No. 1,408,826.

WATERPROOF FABRIC AND PROCESS. A flexible sheet material comprising a suitable foundation upon which is applied a mixture of flock and adhesive binder, coated with flock.—Edward H. Enos, Salem, Massachusetts. United States patent 1,408,871.

RUBBER PRODUCTS AND METHOD OF MAKING THEM. A material adapted to be hardened by heat, the essential constituents of which are a vulcanizable gum material intimately mixed, first, with a vulcanizing agent and then with a comminuted inert substance having its particles coated with a primary or soluble reactive condensation product of the phenol-formaldehyde type.—Edward O. Benjamin, Newark, New Jersey. United States patent No. 1,409,275.

GASKET, PACKING, ETC. A resiliently compressible, tough, stable, non-sticking gasket or packing material consisting of non-combustible, wholly mineral filler, including a lubricating material, held and protected by rubber united with phenolic condensation product in the presence of sulphur, by heat and pressure applied while the condensation product is in the primary soluble state, the completed material containing less than one per cent of uncombined sulphur.—Edward O. Benjamin, Newark, New Jersey. United States patents Nos. 1,409,276 and 1,409,277.

AIR-BAG RENEWER. A composition for the repair of rubber articles, comprising uncured rubber 4 ounces; benzine 6 gills; methyl alcohol 1 gill; sulphur 1 ounce.—James Russell Moyle, Jacksonville, Florida. United States patent No. 1,409,397.

EBONITE SOLUTION. A solution of ebonite in a product obtained by digesting spirits of turpentine with oxalic acid and distilling off the light oils thereof.—William Beach Pratt, Wellesley Hills, Massachusetts, assignor to E. H. Clapp Rubber Co., Boston, Massachusetts. United States patent No. 1,409,570.

SOLUTION FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES. A solution for use in attaching the soles and heels of boots and shoes to their uppers, consisting of about 15 ounces of Venezuelan balata, about 20 ounces of Tumaco balata, and about 15 ounces of solvent naphtha.—Frederick Lee, assignor to George E. Haldinstein, both of Norwich, England. United States patent No. 1,410,685.

METHOD OF TREATING MANUFACTURED RUBBER. The method of treating hardened manufactured rubber which consists in applying to the surface of the rubber a solution containing phenylamine and cotton-seed oil.—Rhetherford B. Martin, New York, N. Y. United States patent 1,410,699.

VULCANIZATION ACCELERATOR. The process of treating rubber or similar materials, which comprises combining with the rubber compound a di-substituted guanadine. Example, the rubber may be compounded in the following proportions in parts by weight: 50 of new rubber; 45.5 of zinc oxide: 3.5 of sulphur; 1 of

diphenylguanadine. These are mixed together in any suitable way and then vulcanized under heat corresponding to about 40 pounds steam pressure, usually for from 10 to 20 minutes.—Morris L. Weiss, Brooklyn, N. Y., assignor to Dovan Chemical Corporation, Wilmington, Delaware. United States patent No. 1,411,231.

## The Dominion of Canada

COMPOSITION FOR TIRES. An anti-leak composition consisting of the following ingredients in parts by weight: fine asbestos fiber 3; ground sheet asbestos 4; ground flaxseed 4; white and yellow dextrine 4 each; gum acacia 1; venetian red 1½; methyl hydrate 1½ gallons and water to form a pulp.—Samuel S. Sainsbury, Toronto, Ontario, Canada. Canadian patent No. 216,331.

VULCANIZING PROCESS. Manufacturing an expanded rubber by applying a coating of vulcanizable rubber to an interior mass formed of a rubber compound having ceresine wax and magnesia mixed therewith and subjecting the mass to the action of heat and an inert gas under pressure in a chamber.—Charles L. Marshall, London, England. Canadian patent No. 216,705.

## The United Kingdom

VULCANIZING ACCELERATORS. Aromatic bases useful as vulcanization accelerators are prepared by treating para-nitroso derivatives in neutral solution with at least one but less than two molecular equivalents of hydrogen sulphide. Benzol or water may be the solvent. From ½ to 2 per cent of the bases may be added to rubber mixture before vulcanization.—The Goodyear Tire & Rubber Co., Akron, Ohio, U. S. A. British patents Nos. 173,545 and 173,546.

RUBBER COATING FOR VIOLINS. To improve the tone of violins they are coated with caoutchouc or its compositions, preferably before varnishing and polishing. Ten or twelve layers of caoutchouc solution in linseed oil, benzine or benzol may be applied to make a thickness of ½ to ¼-mm.—H. Ohlhaver, Hamburg, Germany. British patent No. 174,031.

DENTAL RUBBER COMPOSITION. A mixture of powdered vulcanized rubber and ordinary unvulcanized dental rubber, preferably in equal proportions with or without sulphur as required.—N. Cohen, Croftdene, Croft Road, Swindon. British patent No. 174,471.

PUNCTURE-CLOSING COMPOSITION. Example: 250 parts by weight of dextrin, 50 parts of tripoli, and 170 parts of kaolin triturated and agitated with 600 parts of water; 10 parts of a vegetable gum and a small quantity of gum benzoin are added, and the mixture left, after addition of yeast, until fermentation is set up.—Surpneu Gesellschaft, 27 Gerhardusgasse, Vienna. British patent No. 174,568. (Not yet accepted.)

VULCANIZING INDIA RUBBER. Rubber is mixed with a vulcanizing ingredient, the mixture is treated with a substance adapted to permeate it, and the treated mixture vulcanized. Example, 100 parts of rubber, 10 parts of zinc oxide, 6 parts of oxybutyl-thiocarbonic acid disulphide, and 3 parts of sulphur are compounded to form one stock. A second stock consists of 100 parts of rubber, 10 parts of zinc oxide, 3 parts of sulphur, and 4 parts of aniline. These stocks are blended by milling or by superimposing thin sheets, and articles are made therefrom which are completely vulcanized in a week at 70 degrees F. Heat may be applied to shorten the vulcanizing time.—Naugatuck Chemical Co., Naugatuck, Connecticut, assignee of S. M. Cadwell, Leonia, New Jersey. British patent No. 174,915.

## Germany

### Patents Issued, with Dates of Issue

351,103 (November 27, 1919) Plastic mass. Gesellschaft für Verwertung chemische Produkte m. b. H., Berlin.

351,104 (August 17, 1915) Method of making masses resembling hard rubber. Wenjacit-Gesellschaft m. b. H., Hamburg.

351,785 (April 24, 1918) Method of regenerating all kinds of old rubber. Plaus:n's Forschungsinstitut, G. m. b. H., Hamburg.

351,974 (August 13, 1918) Method for accelerating the vulcanization of rubber or rubber-like materials. Stanley John Peachey, Stockport, England; represented by R. Geisler, Berlin S. W. 11.

### RSL METHYLENE ANILINE

RSL methylene aniline is a condensation product of formaldehyde and aniline. It is analogous to the group of anhydroformaldehyde aniline, formanilide, formaldehyde aniline, etc. These all have exactly the same curing power, weight for weight. RSL methylene aniline differs from them because special precautions are taken in its preparation to insure easy handling in the compound and mill rooms. No master batches are necessary. The accelerator is added directly to the compound at the beginning of the mix.

RSL methylene aniline is most interesting in conjunction with thiocarbanilide where it neutralizes to a large extent the scorching difficulty which is usually encountered. Also this combination of accelerators has the advantage of a long, flat curing curve. In other words it does not overcure readily with increased time of heating. Its applications are in treads, breakers, bead stocks, etc. Methylene aniline may also be used advantageously in frictions.—The Rubber Service Laboratories, Akron, Ohio.

### XANTHOPONE

Xanthopone, ethyl-xantogenate of zinc, acts as an ultra-accelerator in compounds of rubber, sulphur and zinc oxide, effecting a cure at 108 to 125 degrees C., 126 to 257 degrees F. Rubbers cured with xanthopone have a light color and mold well. This accelerator is especially recommended for repair stocks, dental rubbers and rubberized textures of delicate colors.

### THIURAMDISULPHIDE

The use of thiuramdisulphide in rubber as an accelerator of vulcanization has been covered by United States patent No. 1,413,172 and assigned to R. T. Vanderbilt Co., Inc., 52 Vanderbilt avenue, New York, N. Y. This patent relates to the accelerator marketed by this company under the trade name of "Super-Sulphur."

### THE SWELLING OF RUBBER IN VARIOUS LIQUIDS[1]

A relation between the swelling power ($S$) and any specific property of the liquid has not been previously determined. Experiments show that there is a definite relation between $S$ and the dielectric constant ($D$) of the solvent. In 15 liquids $S$ decreased rapidly with increase in $D$. By using the reciprocal of the solubility it was shown that the amount of solvent required is a simple function of the $S$ value of the liquid. A high value of $S$ represents a low solubility, and a high value of the reciprocal of the latter.

[1]By Wolfgang Ostwald, Phys. Chem. Inst., Leipzig, in Kolloid-Zeitschrift, 29, 100-5, 1921. Abstracted through Chemical Abstracts.

### THE COLD AUTO-POLYMERIZATION OF BUTADIENE[1]

Several tubes of butadiene kept in the dark for 5 years changed to a white brittle substance containing small particles of butadiene. This material was shown to differ from the analogous products of $\beta,\gamma$-dimethylbutadiene and of isoprene. There are, therefore, now known three entire series of polymerization products of the three chief butadienes, namely erytherin (butadiene), isoprene ($\beta$-methylbutadiene) and $\beta,\gamma$-dimethylbutadiene: (1) cold polymerization products, (2) hot polymerization products, or normal rubbers, (3) abnormal rubbers obtained by means of sodium without carbonic acid.

[1]C. Harries, Gummi-Zeitung, 1921, 35, 898.

# Meeting of the Rubber Division of the American Chemical Society

THE sixty-third meeting of the American Chemical Society was held at Birmingham, Alabama, April 4 to 7. The total registration for the meeting was about 350, or whom ten per cent were of the Rubber Division membership. Practically every one of the leading 25 or 30 rubber companies of the United States and Canada was represented in the attendance.

Dr. W. C. Geer, vice-president of The B. F. Goodrich Co., by special request repeated his address read before the general meeting.

The following resolution was unanimously adopted:

> *Resolved* that the Rubber Division of the American Chemical Society adopt Dr. Geer's method for conducting accelerated age test as the standard accelerated age test of the Division.

The scheduled program of the Rubber Division meetings was somewhat briefer than usual and related largely to matters pertaining to physical properties and testing.

## Abstracts of Papers

### Recent Developments of the Chemistry of Rubber

BY DR. W. C. GEER

Dr. Geer urged the American Chemical Society to take steps to form a "gas defense committee," as a means of protecting Americans in case of another war.

"Our friends in Washington," said Dr. Geer, "may agree to abolish poison gases from warfare. We should, however, be active in preparing methods of defense. We are forbidden to carry concealed weapons but there is no law of God or man to prevent us from the use of locks on our doors and bolts on our windows.

"I would earnestly recommend to the American Chemical Society the formation of a gas defense committee to investigate gas masks and other protective clothing, alone, as far-sighted patriotic citizens if cooperation with the War Department be not allowed. It is a field in which research work of a cooperative character can be undertaken, with who knows what valuable results to us in the future.

"Another urgent problem of national importance is the development of a fabric for dirigible balloons which hydrogen and helium cannot penetrate.

"Gold-beaters' skin, now used, is expensive and adds nothing to the strength of the fabric in rigid dirigibles."

### The Thermal Properties of Various Pigments and of Rubber

BY IRA WILLIAMS[1]

The thermal conductivity and diffusivity of rubber are determined by two separate methods. A method for the determination of the conductivity of pigments is given and the values have been determined for the most common pigments used in rubber compounding. A method is shown by which the thermal conductivity and diffusivity of any rubber compound may be calculated from an analysis of the stock.

### Physical Properties of Rubber Compounded with Light Magnesium Carbonate

BY H. W. GREIDER[2]

The physical properties of rubber compounded with light magnesium carbonate have been studied, including tensile strength, elongation, hardness, resilient energy capacity, and permanent set. This material was shown to behave in rubber as a reinforcing or toughening pigment, the maximum effect being given by nine volumes of the filler to 100 volumes of rubber. The principal disadvantage of magnesium carbonate in rubber was found to be the high permanent set imparted to the vulcanized product, attributable to the definite crystalline character of the particles. The reinforcing effect of magnesium carbonate at nine volumes per hundred of rubber was compared with equal proportions of other reinforcing pigments including zinc oxide, gas black, fine china clay and colloidal barium sulphate. Gas black was shown to be the only filler showing a reinforcing effect greater than that given by light magnesium carbonate.

[1]Research Laboratories, Firestone Tire & Rubber Co., Akron, Ohio.
[2]Industrial Fellow, Mellon Institute of Industrial Research of the University of Pittsburgh, Pittsburgh, Pennsylvania.

### The Relation Between Chemical and Physical State-of-Cure of Rubber Vulcanized in the Presence of Certain Organic Accelerators

BY NORMAN A. SHEPARD AND STANLEY KRALL[3]

Hexamethylene tetramine, aldehyde ammonia, *p*-nitroso dimethylaniline, and thiocarbanilide, respectively, have been introduced in such quantities into a mixing consisting of 48 parts of first latex crêpe, 48 parts of zinc oxide and 3 parts of sulphur, that equivalent *physical* states of cure (as gaged by the stress-strain relations) were obtained in each case when vulcanized for 60 minutes at 287 degrees F. The coefficients of vulcanization of these cures show that there is no uniform relationship between the *physical* and *chemical* states of cure in these stocks, even though the time and temperature of curing are constant.

The equivalent quantities used in this work indicate that, in the type of stock here examined, one part of hexamethylene tetramine is equivalent in accelerating power to one and one-half parts of aldehyde ammonia, three parts of thiocarbanilide and one-half part of *p*-nitroso dimethylaniline, respectively.

### Physical Testing Graphs

BY W. B. WIEGAND

There is extreme diversity in the method of presenting the results of physical tests on rubber. This paper contains a suggestion for the graphic depiction of such tests on a single sheet.

On the left half of the sheet are: 1. Breaking (and, if desired, intermediate) tensiles against time of cure. 2. Sub-permanent set against time of cure. 3. Elongations against time of cure.

On the right half of the sheet the following: 4. Stress-strain curves with tensiles as ordinates and elongations as abscissæ. 5. Energy of resilience at rupture as ordinates against time of cure as abscissæ. 6. Tensile product on the same scale as energy.

In all cases scale divisions are chosen so that one division roughly corresponds to the limit of accuracy of the testing machinery. English units are used throughout.

## Report on Methods of Analysis

The report of the Committee on Rubber Division Methods for Chemical Analysis was postponed to the fall meeting to be held in Pittsburgh.

The symposium on accelerators was somewhat limited in scope and developed nothing new or interesting.

[3]Research Laboratories, Firestone Tire & Rubber Co., Akron, Ohio.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients," also "Rubber Machinery."

# Tires for Highway Transportation[1]

By E. W. Templin[2]

THE author states that his purpose is to determine if present practice is headed in the right direction as regards providing the means and methods of transporting freight over the highways in respect to the following: (1) number of ton-miles of goods to be shipped; (2) shipping points and destination; (3) kinds of highway available; (4) type of vehicle most suitable; (5) cost of operation per ton-mile; (6) rates to be charged for service.

A most important factor in the destruction of highways is the impact of the tires. The relative force of tire impact has been tested by the author for pneumatic and solid tires under parallel conditions. Tests are being conducted on this subject by the Bureau of Public Roads of the Department of Agriculture, under the direction of A. T. Goldbeck and E. B. Smith.

The conclusions drawn from these tests are:

(1) With solid tires the force of the impact increases rapidly with increase in speed; whereas with pneumatic tires the force increases only slightly with a large increase in speed.
(2) Pneumatic tires give only one-third to one-fifth the impact force of solid tires.
(3) A 5-ton truck on pneumatic tires can travel 24 miles per hour with the same impact effects that a solid-tired truck having new tires will cause at 8 miles per hour.
(4) The value of the impact force with pneumatic tires is only from 1,000 to 1,500 pounds greater than the wheel load. With the worn solid tire the impact force became 38,000 pounds greater than the wheel load of 7,000 pounds at a speed of only 10 miles per hour over a drop of 2 inches in the test of a 3-ton truck.

The conditions the highway must meet, in addition to the gross load of the vehicles, are the maximum tire load, the pressure per square inch exerted by the tire upon the pavement and any impact blow that the tire may exert upon the pavement. Pneumatic truck tires do not in any measure reduce the maximum load per tire but they decrease the pressure per square inch upon the pavement because they present twice the area of contact that solid tires present. More important, the impact blows of pneumatic tires are practically negligible, while solid tires build up impact blows to many times the weight of the wheel load.

A 6-inch solid tire was compared with an 8-inch pneumatic tire, since in practice they are used to carry corresponding loads. Each tire was placed in a beam-testing machine and a load was gradually applied so as to depress the tire over a 70-pound railroad rail. Readings of the load and the corresponding depression were taken at regular intervals. Under a 7,000-pound load the new solid tire deflected 0.7-inch, but the corresponding 8-inch pneumatic tire deflected 3.4 inches, or 4.9 times as much. However, for consideration of tire effects upon the highway, the worn solid tire should be the one considered. The three-quarter-worn solid tire about 1 inch thick depressed only 0.3-inch under a 7,000-pound load and the corresponding pneumatic tire depressed 3.4 inches, or slightly more than 11 times as much. The tests were repeated with a 12-inch solid tire against a 12-inch pneumatic tire and practically the same proportions held.

In regard to the state of development of the pneumatic truck tire and the average mileage secured by its users, Table 1 gives an analysis of 500 trucks showing the average mileage secured.

TABLE 1.—PNEUMATIC TRUCK TIRE CARRYING CAPACITY AND MILEAGE

| Size of Tire Inches | Carrying Capacity Pounds | Average Mileage |
|---|---|---|
| 6 | 2,200 | 14,026 |
| 7 | 3,000 | 14,791 |
| 8 | 4,000 | 12,782 |
| 9 | 5,000 | 12,028 |
| 10 | 6,000 | 11,317 |
| 12 | 9,000 | Still experimental |

It is generally conceded that pneumatic truck tires will not withstand overloading successfully. The larger sizes, 10 and 12-inch, introduce new problems, including those of service, availability of necessary air pressure and the disposition of the driver in taking care of the equipment. The 10-inch tire gives very satisfactory service where it is properly handled, although it is heavy and costly. The 12-inch tire gives very gratifying results from the mileage standpoint, but it appears to be too high, too

Six-Wheel Truck

heavy and too costly to give general satisfaction. On this account we feel that there is good reason for experimenting with the application of four small-size tires to replace the two 12-inch rear tires. Since there are many objections to the use of dual pneumatic tires in the sizes above 5-inch, applying the tires in tandem seemed advisable, and, the 5-ton truck shown herewith was constructed to test the practability of this tire.

This 6-wheel truck has been tested by the Bureau of Public Roads with the following results:

The impact delivered by the 6-wheel truck loaded with a 6-ton pay-load was equal to the impact delivered by an ordinary 2-ton truck having a 2-ton pay-load.

The bearing pressure upon the highway pavement is at a maximum under each of the rear wheels, approximately three pounds per square inch maximum as against six pounds per square inch for an ordinary 5-ton truck with a 5-ton pay-load.

The maximum impact delivered by the 6-wheel truck with a 9-ton pay-load was approximately 10,000 pounds as against a maximum blow of possibly 70,000 pounds delivered by an ordinary 5-ton truck with a 7½-ton pay-load.

## UNITED STATES EXPORTS OF INSULATED WIRE AND CABLE INCREASE

Recently-compiled statistics show that United States exports of insulated wire and cable increased from $8,208,539 in 1920 to $8,573,820 in 1921. Exports of all classes of electrical goods totaled $97,935,597, while nine out of the twenty different items in 1921 were well ahead of 1920.

[1] Highway Transportation as It Affects the Automotive Engineer. Journal of the Society of Automotive Engineers, March, 1922.

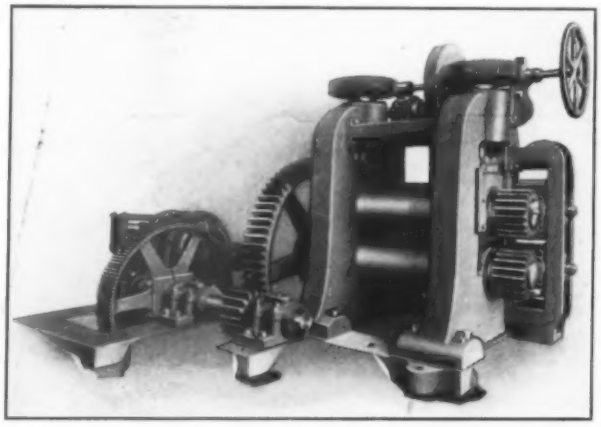
[2] Motor-truck engineer, development department, The Goodyear Tire & Rubber Co., Akron, Ohio.

[3] Record of previous investigations on this line will be found in THE INDIA RUBBER WORLD, November, 1920, page 85, and June, 1921, page 655.

# New Machines and Appliances

## Tin Rolling Mill for Hard Rubber Work

In the manufacture of hard rubber goods tin is used in sheets for encasing such articles as comb blanks, for surfacing hard rubber in the form of sheets, and where smooth, flat surfaces are to be produced on the vulcanized product. For the purpose of producing sheet tin for this use, a rolling mill or calender is employed. Such a mill is shown in the illustration. It comprises two short polished steel rolls supported in heavy housings. A special feature of note in the machine shown is the plan of connecting the driving roll with the driven one by means of two gears contained in special housings. This arrangement allows greater latitude in the separation of the rolls without danger of stripping the gear teeth. Regulation of the gage of sheet produced is effected by



Tin Rolling Calender

adjustment of the top roll, either by hand or electric motor. The mill itself is motor-driven.—William R. Thropp Son's Co., Trenton, New Jersey.

## "Watson Holdtite" Collapsible Tire Core

The latest and what is claimed to be a successful collapsible tire core is that known as the "Watson Holdtite." In its design and workmanship special regard was given to secure reduced cost of upkeep, saving of operating time, durability in service, perfect alinement and no open joints when assembled. The sections are held together by two steel rings of "L" shape section-threaded to screw down one within the other.

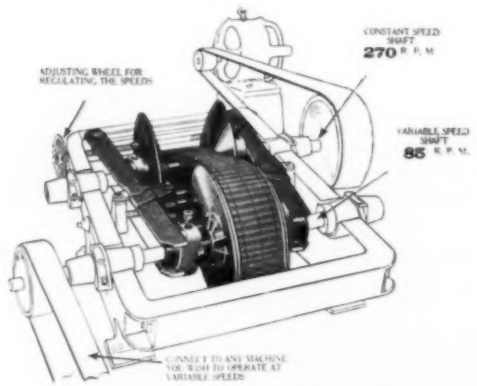
The outer edges of the rings have tapered shoulders that register into corresponding tapered grooves in the core sections as the rings are screwed together. The sections are therefore gripped firmly on both sides as well as on the inner surface of the core tongue. This insures the strongest possible construction.

In assembling, the sections are laid around one ring. The other ring is placed in position and given a couple of quick turns by hand, the sections are thus gripped securely, but to insure against any possible loosening of the rings a pin face spanner wrench is used to tighten the rings more securely. The same wrench is used to disassemble the core.

This core is not an experiment as it has been practically demonstrated with success in tire production.—The Claflin Engineering Co., Lancaster, Ohio.

## Speed Changing Device

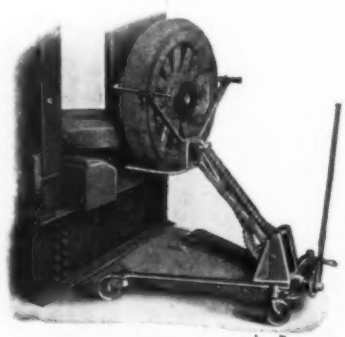
In many rubber factories machine operations are conducted which call for variable speed control of the product as, for example, delivery of calendered sheet or operation of spreaders, wrapping machines, tire tread calenders, conveyors, etc. A variable speed transmission that has been widely adopted by American rubber factories in many branches of the industry is shown in the illustration. With this machine it is possible to secure a speed variation as high as 14 to one. These transmissions are regularly manufactured in horsepower capacities from one to 150 horsepower, and ranges of variation from two to one up to 14 to one. The field of use of variable speed transmission is rapidly widening in the rubber industry, due to appreciation of the fact that an efficient means of speed control is essential to the maintenance of both quality and output of product.—Reeves Pulley Co., Columbus, Indiana.




Reeves Variable Speed Transmission

## "Hi-Lift" Jack

The illustration shows a new high lifting jack which is greatly appreciated in many situations in connection with automobile work and handling heavy tires. The machine serves as both truck and lifting jack. The value of its portability and high lifting capacity is seen in the situation illustrated where a heavy solid tire mounted on a truck wheel is being raised to the bed of a hydraulic tire-applying press for changing. The method is more convenient than using a chain-hoisting block, and is absolutely safe.



Handling Solid Tire with "Hi-Lift" Jack

The saddle on which the load rests is provided with a link motion that always keeps it level, so that there is no danger of the load sliding off.

The dependable worm and gear sector construction makes it absolutely impossible for the load to be accidentally released. This

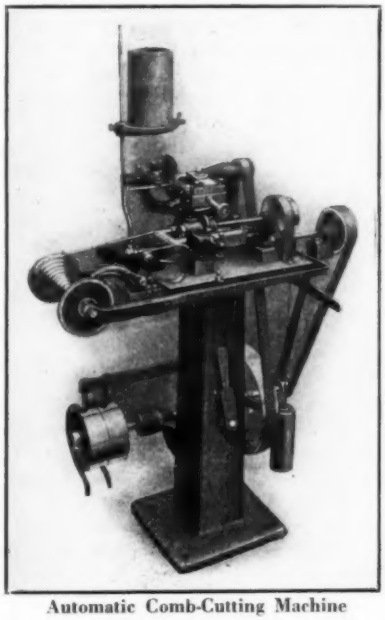
construction also insures raising the load smoothly and permits it to be raised or lowered the smallest fraction of an inch.

The wheels nearest the jack handle are mounted on ball and roller-bearing castors, enabling the operator to guide the jack easily into any desired position by means of the long lever handle.

The construction is of steel and malleable iron throughout. It has a lifting capacity of 3,000 pounds and a maximum width of 40 inches.—Weaver Manufacturing Co., Springfield, Illinois.

## German Machine for Cutting Combs Automatically

The illustration shows an automatic belt driven comb cutting machine of German manufacture. The comb blank is clamped in the carriage seen in front of the circular saw, above which is placed a tank arranged with a cock for dripping water onto the comb blank being sawed. The carriage is reciprocated to and from the saw, the interval between the cuts being regulated by the drum and chain device at the left by a pawl and ratchet actuated by a suspended weight at the opposite side of the machine.

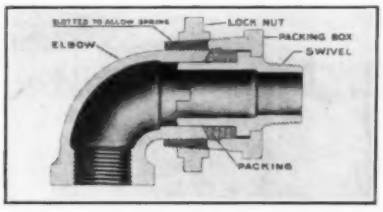


Automatic Comb-Cutting Machine

It is claimed for this machine that it is practical, convenient, and is easily controlled and operated for efficient production of hard rubber combs.—Weisbrod & Co., Eythra-Leipzig, Germany.

## Improved Swing-Joint for Press Rooms

Swing joints are so common and important an item in rubber factory equipment, especially on hydraulic presses that the improved construction here given in cross-section will be of interest. This fitting is designed to provide a perfectly tight swivel connection for steam, water, gas or air. As the packing used is saturated with oil and graphite the joint is properly lubricated and cannot stick. It will be noted that the packing box is screwed onto the thread on the fitting which forces the packing around the swivel and makes a tight joint. The packing box is slotted and, having a taper thread on the outside, is held in position by the lock nut, making it a simple matter to tighten up the packing box or renew the packing which cannot work loose.

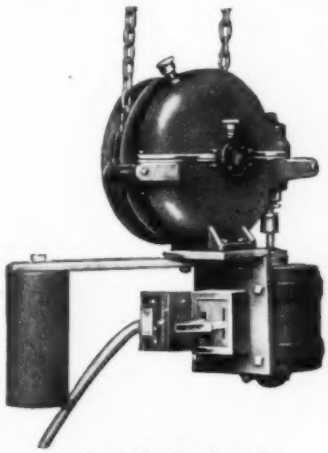



High Pressure Swing-Joint Fitting

Fittings of this type provide connections that are free to turn through any part of a circle, and at the same time are perfectly tight against high steam pressure.—Atlas Valve Co., 282 South street, Newark, New Jersey.

## Electric Hoist

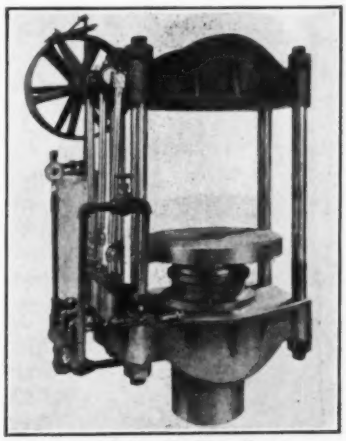
A new electrically-operated hoist is here illustrated, which has been aptly termed the "Handiman." Users of hand-power hoists of five tons or larger capacity will be interested to learn that this patented electric machine can be suspended in the bight of the operating chain, has a chain-hauling speed of 138 feet a minute, and a chain pull of 130 pounds. This gives a load-lifting speed of approximately four times that obtainable by hand power and requires but one man for operation. The current is supplied by a flexible conductor from convenient sockets or suspended from the hoist if desired. The machine is easily handled, self-balanced, and weighs about 160 pounds. Its gears are hardened and run in oil. It can be furnished for operation on both alternating and direct current.—New Jersey Foundry & Machine Co., 90 West street, New York City.



Mechanical "Handiman"

## Solid-Tire Applying Press

The illustration shows a 250-ton hydraulic press for applying or dismounting solid truck tires. It is built with heavy cast steel frame, or resistance pieces, thus eliminating the springing and jumping which takes place when a press employing structural steel beams or channels is subjected to heavy strain. The top platen is steel cast solid with top resistance piece. The bottom platen is steel and removable from the top of the ram.



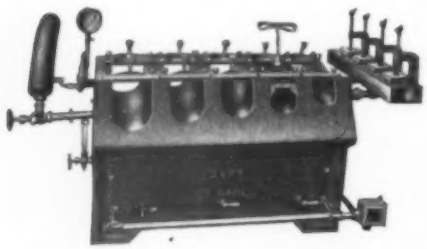
West Hydraulic Tire Press

The power hydraulic pump is three-plunger type, with automatic cut-out for large plunger. The pump has one two-inch low-pressure plunger for throwing a greater volume of oil to fill pipes and cylinder rapidly. When about 200 pounds pressure is attained, the large plunger is automatically cut out by a by-pass valve leaving the two smaller plungers in operation for completing the higher pressure required for maximum tonnage. The travel or stroke of the ram is 33 inches. This press is distinctive as compared with other presses for the same purpose, in that where this press will use 2,000 pounds initial pressure, other presses often require 5,000 pounds initial pressure.—The West Tire Setter Co., Rochester, New York.

## Multiple-Cavity Tire-Repair Vulcanizer

The construction of the machine illustrated is known as the single block type. It has the advantage of compactness, requiring

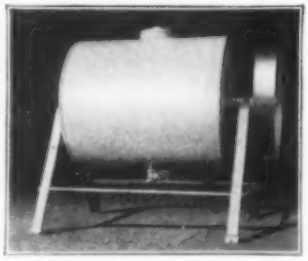
the least amount of space, and every cavity is always ready for service. The machine shown is heavily built with long deep curing spaces, a double row of bead-mold clamps and all other necessary fittings complete. Naturally the five-cavity models give superior facilities with cavities of exact cord-tire sizes and capable of vulcanizing both fabric and cord tires. These vulcanizers are all gas-heated and tube and tread repair attachments are piped to either end of the main vulcanizer, forming a complete unit.—Wood-Craft Co., Saint Paul, Minnesota.



**Single-Block Type Five-Cavity Vulcanizer**

### Cement Mixer

A 250-gallon rubber cement mixer is represented in the illustration. This machine is made from 14-gage metal in the body and 12-gage flange head, all electric welded. The main shaft is of cold-rolled steel, to which are welded steel agitators which very much shorten the time of mixing. The filling head is an important feature of this mixer. It is fitted with a leakproof aluminum cap. The mixer has a 2-inch gate-valve for drawing off the cement. This style of mixer is built in various sizes from 80 to 500 gallons capacity.—The J. C. Heifner Manufacturing Co., Ashland, O.



**Heifner Rubber Cement Mixer**

### Mixologer for Continual Stirring

The illustration shows a convenient mixing machine consisting of a tank mounted on a simple standard. On top of the tank is a power-operated mechanism for slow and continual stirring. The receptacle is filled from the top and emptied by means of a faucet. An arrangement such as this provided with a quick-opening gate-faucet will be found very suitable for holding a stock of rubber cement containing litharge or other heavy ingredients which tend to settle out on standing. The mixologer will be appreciated by every factory foreman whose work requires a mixing container to maintain uniformity of stock solutions.—United Shoe Machinery Corporation, Boston, Massachusetts.

**Mixologer**

### Shell for Cord Fabric

A cord tire shell that meets the most severe requirements is made of either two or four pieces with joints securely glued, making a perfectly round shell. A steel retaining ring is inserted in each end under pressure and cannot work loose. There is absolutely no metal on the surfaces of the shells which are simply coated with shellac. The shell can in no way injure the fabric wound upon it.—Blossom Brothers, New Bedford, Massachusetts.

## Machinery Patents

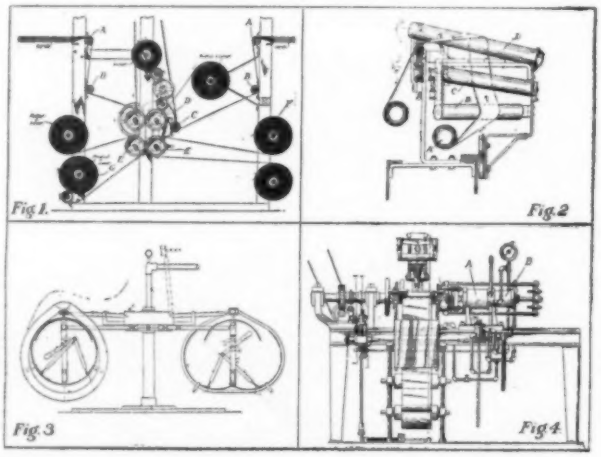
### Making and Rubberizing Cord Fabric

A cross-section is given, in Fig. 1, of a machine for making a composite rubber and cord fabric adapted for use in making a cord tire. The advantage gained is thorough isolation and coating of the individual cords with rubber so that there is no rubbing contact of the cords in service, and at the same time the method enables a large quantity of product to be made at low cost and with practically no waste.

Previous to assembly, the strands composing the cords are impregnated with rubber cement, the solvent evaporated, and the strands twisted to form the cord. Thus rubberized, the cords are assembled with raw sheet rubber as indicated in Fig. 1. The cords pass in parallel sets into the machine, guided by rollers A, B, C, grooved to space the cords individually. Thus spaced, the cords pass over the roller D. From the opposite side of the machine similar rubberized cords enter and the roll spacing is such that cords from one side alternate in the fabric with cords from the other side. A sheet of uncured rubber enters the rolls over the cords from one side and is compressed as a center ply. From rolls DD the cord fabric passes through rolls EE, where it receives on either side a sheet of unvulcanized rubber coming from stock rolls FF, passing completed to roll G.—Irvin E. Fair, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,405,992.

### Wrapping Uncured Tubes from Cured Tubes

The carriage or moving part of a machine for wrapping uncured tubes from cured tubes is shown in Fig. 2 in elevation. This carriage moves freely from end to end of the machine as the wrappers pass through it in operation. The course of the wrapper is upward from the cured inner tube on the pole over the angled tension rollers B, C, and D, and thence over a spring-supported tension or smoothing bar to the adjacent parallel pole




**Machines for Cord Fabrics, Wrapping Tubes, Deflating Tubes, and Battery Jars**

holding the uncured tube to be wrapped.—T. A. Jordan and A. E. Caesber, Indianoplis, Indiana, assignors to G. & J. Tire Co., an Indiana corporation. United States patent No. 1,405,418.

### Tube Deflating Machine

The machine illustrated in Fig. 3 provides a support for an inner tube in such manner as to easily and thoroughly deflate it. The device engages the inner periphery of the tube so as to cause

its walls to collapse and also to prevent its twisting. At the same time, provision is made for opening the tire valve, the mechanism being preferably applied in conjunction with suction for removal of the air in the tube. In order to separate the walls of the tube at the point of the valve, a suitable spreading device is provided, supported upon the central holder so that it can be thrown back above the latter when not in use.—Henry P. Kraft, Ridgewood, New Jersey, assignor to A. Schrader's Son, Inc., Brooklyn, N. Y. United States patent No. 1,405,230.

### Machine for Making Battery Jars

The front elevation of a machine for making battery jars and other receptacles is shown in Fig. 4. The construction shows a base suitably supported, carrying brackets in which a main shaft is journaled. The machine is belt-operated through a worm-gear. The machine comprises an intermittently-rotating mandrel on the main shaft upon which the box stock is wrapped, and a pair of cylinders, the purpose of which is to push up a forming die to fold the projecting edges of the sidewall stock into contact with the bottom of the box. The mandrel employed has slots to receive rubber pieces placed by hand to form lugs in the bottom of the jar. When these pieces are in position, a corrugated feed roller and a smooth pressure roller pass the rubber stock for the box walls between a flexible plate and a bed on the frame and thence to the mandrel. A sliding knife is mounted on a rod to cut the stock with beveled edge for a complete wrapping around the mandrel. Means are provided to guide the stock evenly to the mandrel. Pressure rolls for wrapping the stock around the mandrel are placed above and are operated by a foot-lever controlling air pressure. To finish the box, a forming die is forced against the rubber stock on the end of the mandrel, folding over the projecting sidewall stock by means of the piston in the cylinder A. The die mentioned is drawn back from the box by counter pressure in cylinder B.

The machine is rapid in operation and eliminates waste of stock, while the uniformity of the work insures regular production.—Joseph W. Bishop, Muskegon, Michigan, assignor to The Brunswick-Balke-Collender Co., Chicago, Illinois. United States patent No. 1,407,979.

## Other Machinery Patents

### The United States

1,408,456 Apparatus for drying materials. B. S. Harrison, Brooklyn, assignor to Carrier Engineering Corporation, New York—both in in New York.
1,408,457 Method of an apparatus for drying materials. B. S. Harrison, Brooklyn, assignor to Carrier Engineering Corporation, New York—both in New York.
1,408,458 High temperature heating system. B. S. Harrison, assignor to Carrier Engineering Corporation—both of New York, N. Y.
1,408,980 Vulcanizing expansible core for tires. O. L. Bruce and E. Aze, Minneapolis, Minn.
1,409,095 Repair vulcanizing apparatus. L. Greenwald, assignor to The Firestone Tire & Rubber Co.—both of Akron, O.
1,409,113 Bootlast. J. Kramer, assignor to Firestone Tire & Rubber Co.—both of Akron, O.
1,409,467 Bead-covering machine. E. D. Putt, assignor to Firestone Tire & Rubber Co.—both of Akron, O.
1,409,582 Last for forming repair patches. J. Robertson, Jr., Weehawken, N. J.
1,409,591 Combination mold for rubber goods. A. L. Schavoir, Stamford, Conn.
1,409,792 Tire-making machine. A. Shaw and W. K. Glennon, assignors to The Goodyear Tire & Rubber Co.—all of Akron, O.
1,409,995 Core for pneumatic tires and method of construction. P. B. Bosworth, Springfield, O.
1,410,023 Expansible bag for vulcanizing tires. L. R. McGuire, Akron, O.
1,410,296 Vulcanite scraper. G. O. Hannah, St. John, N. B., Can.
1,410,309 Apparatus for building pneumatic tires. E. Hopkinson, New York, N. Y., and H. V. Lough, Hartford, Conn., said Lough assignor of his entire right to the Hartford Rubber Works Co., a Connecticut corporation.
1,410,615 Mold for rubber articles. W. A. Snook, Trenton, N. J.
1,410,693 Repair vulcanizer. R. MacDonald, assignor by mesne assignments to F. W. Mangold—both of Schenectady, N. Y.
1,410,732 Apparatus and method for imprinting hard-rubber articles. A. C. Brose, New York, N. Y.
1,410,819 Tire-repair tool. C. E. McNemar, Manhattan, Kans.
1,411,095 Repair vulcanizer. J. E. Henry, New York, N. Y.
1,411,225 Repair vulcanizer. P. F. Schecher, St. Mary's, Kans.

### The Dominion of Canada

216,405 Tire retreading vulcanizing mold. M. Reid, Vancouver, B. C.
216,729 Apparatus for recovery of volatile solvents. D. V. Plumbridge, Liverpool, Lancaster, Eng.
216,806 Stitcher mechanism for tire-making machines. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of R. A. Holmes, Detroit, Mich., U. S. A.
216,829 Apparatus for forming tires. The Doughty Tire Co., Boston, Mass., assignee of H. J. Doughty, Providence, Rhode Island—both in U. S. A.
216,835 Tire-making machine. Firestone Tire & Rubber Co., assignee of W. C. Stevens—both of Akron, Ohio, U. S. A.
216,836 Bead-cementing apparatus for tires. Firestone Tire & Rubber Co., assignee of W. C. Stevens—both of Akron, Ohio, U. S. A.
216,837 Apparatus for manufacturing tires. Firestone Tire & Rubber Co., assignee of W. C. Stevens—both of Akron, Ohio, U. S. A.
216,838 Bead-cementing and drying apparatus. Firestone Tire & Rubber Co., assignee of H. F. Maranville—both of Akron, Ohio, U. S. A.
217,395 Apparatus for making tire flaps. J. L. G. Dykes, Chicago, Ill., assignee of E. Hopkinson, New York City—both in U. S. A.

### The United Kingdom

173,824 Tire-making machine. The Goodyear Tire & Rubber Co. and F. A. Seiberling, 1144 East Market street, Akron, Ohio, U. S. A.
173,895 Apparatus for making tires. E. C. R. Marks, 57 Lincoln's Inn Fields, London; The Fisk Rubber Co., Chicopee Falls, Mass., U. S. A.
174,038 Mandrel for vulcanizing joints of inner tubes. E. Fetter, Fifth street, Highlandtown, Baltimore, Maryland, U. S. A. (Not yet accepted.)
174,539 Repair vulcanizer. G. L. Pauer, 17 Theresienstrasse, Vienna.
174,725 Mandrel for joining ends of inner tubes. W. Frost and H. Frost & Co., Limited, 148 Great Portland street, London.

### Germany

#### Patents Issued, with Dates of Issue

350,740 (December 9, 1920) Press for printing pictures on rubber balls. Heinrich Meyer, Hanover-Badenstedt.
351,426 (September 23, 1920) Apparatus for vulcanizing the side pieces of automobile tires. Kuhlen & Laudien Essen Ruhr.
351,614 (February 1, 1920) Apparatus for forming tire treads. Thomas Sloper, Southgate, Devizes, England; represented by Meffert and Dr. Sell, Berlin S. W. 68.
352,422 (May 9, 1920) Mold in three parts for making concavo-convex rubber heels. John George Tufford, Elyria, Ohio, United States; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil; M. M. Wirth, all of Frankfort-on-the-Main, and T. R. Koehnhorn and E. Noll, of Berlin S. W. 11.

#### Design Patents Issued, with Dates of Issue

806,259 (December 12, 1921) Apparatus for vulcanizing defective bicycle tubes. Metallwerk Max Brose & Co., Koburg.
806,521 (January 16, 1922). Repair box for rubber shoes. Curt Schellbach, Gummiwarenfabrik, Seiferitz-Meerane, Saxony.
807,172 (June 12, 1920) Apparatus for making rubber goods and the like. Satyr-Luftreifen Gesellschaft Eichler & Co., Berlin.
807,626 (September 14, 1921) Appliance for changing rubber heels. Gustav Adolf Jakubowsky, Mannheim, U. 3, 8.
807,960 (August 6, 1921) Press stamp for hand presses for vulcanizing defective rubber tubes. Arnold Max Bree, Sudwestkorso 15, Berlin-Friedenau.
808,221 (January 18, 1922) Automatic pneumatic pump. Ernst Behringer, Markt 8, Naunhof, near Leipzig.
808,622 (May 25, 1920) Mold for heels of rubber or the like. Heinrich Frühwein, Gunderodestrasse 12, Frankfurt-on-the-Main.

## Process Patents

### The United States

1,408,678 Vulcanizing rubber articles. H. D. Ayres, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,409,059 Manufacture of sponge rubber balls. T. W. Miller, assignor to The Faultless Rubber Co.—both of Akron, O.
1,409,154 Manufacture of perforated blown rubber articles. T. Davis, New York, N. Y.
1,409,418 Attaching retreads to worn tire casings. W. E. Shawger, assignor to George W. Eno Rubber Co.—both of Los Angeles, Calif.
1,409,959 Manufacture of tobacco pouches. R. Lochhead, assignor to Tyer Rubber Co.—both of Andover, Mass.

### The Dominion of Canada

216,255 Manufacture of inner tubes. The McWade Tire & Rubber Co., assignee of J. J. Shoemaker, both of Garrettsville, and C. C. Cox, Niles—both in Ohio.
216,470 Treatment of raw rubber by heating, etc. The Dunlop Rubber Co., Limited, assignee of J. V. Worthington and A. W. T. Hyde—all of Regents Park, London, Eng.
216,761 Manufacture of pneumatic tires. T. Sloper, Devizes, Wiltshire, Eng.

### The United Kingdom

174,387 Manufacturing rubber charges for injection into denture mold by means of pump, in form corresponding to shape of pump barrel. C. Joannides, 36 Place de l'Ambassade d'Angleterre, Constantinople.

# Annual Report of the United States Rubber Co.

THE thirteenth annual report of the United States Rubber Co., presented at the annual meeting, April 18, 1922, showed the company to be in a strong financial and trade position to meet the future, following substantial liquidation during a year of general business depression. Net sales amounted to $164,706,621, a decrease of $91,443,510 or 35.70 per cent compared with 1920. Net profits amounted to $492,811, compared with $21,220,983 in 1920. During the year inventories were reduced $46,561,003, of which approximately $18,000,000 was in price reductions, $18,707,660 in further inventory write-downs, and approximately $10,000,000 in excess cost of finished goods manufactured in 1920 and sold at 1921 prices. Financial obligations were reduced $40,681,798, of which $16,800,000 represented contractual liabilities for forward commitments of materials and supplies. The surplus as of December 31, 1921, amounted to $30,048,439, being a decrease of $17,276,941 as compared with 1920.

The annual report follows:

## The Chairman's Report

*To the Stockholders of the United States Rubber Co.:*

The following is the report of the operations of the company for the year ended December 31, 1921, and of the position of the company at the close of the year. A preliminary statement was sent to the stockholders on February 17, 1922, in order that they might be advised as promptly as possible as to the affairs of the company, owing to the unusual conditions that had continued throughout the year 1921. The results as shown in the preliminary statement were substantially the same as those reported herein.

The year 1921 was one of readjustment and liquidation, and, therefore, any statement of profits or income for that period would be misleading unless due consideration is given to the conditions which confronted the company at the beginning of the year, as well as those which developed during the year, and especially to the extent to which liquidation, both as to inventories and financial obligations, has been effected during the year, in connection with operations. The volume of business during 1921 expressed in tonnage or units rather than in dollar volume of sales was satisfactory in view of the general business depression that prevailed practically during the entire year throughout the country, and in fact the world.

As hereinafter explained in detail:

(a) Financial obligations, including forward commitments, were reduced $40,681,798, all accounts being met as they fell due and full advantage being taken of all cash discounts;

(b) Approximately $10,000,000 of excess cost of finished goods carried over from 1920 and sold in 1921, as compared with the average cost of producing similar goods in 1921, was absorbed in the operations for the year;

(c) Drastic trade reductions in selling prices, made after January 1, 1921, decreased the amount which otherwise would have been received for the goods sold during the year by approximately $18,000,000, thereby reducing net profits to the same extent;

(d) Inventories of materials and finished goods were finally adjusted by further write-down amounting to $18,707,660, and as this was definitely allocated to 1920, $8,022,615 was charged against reserves previously created, and the remainder, amounting to $10,685,045, was appropriated from corporate surplus.

### Operations for the Year 1921

The net sales for the year amounted to $164,706,621, being a decrease of $91,443,510, or 35.70 per cent, compared with the sales for 1920, which were the largest in the history of the company.

After absorbing approximately $10,000,000, representing the excess cost of finished goods carried over from 1920 and sold in 1921 as compared with the average cost of producing similar goods in 1921, but before the adjustment of inventories, all of which adjustment is definitely allocated to 1920 as hereinafter explained, the net profits for the year amounted to $492,811 after all interest and other current charges, notwithstanding a reduction of approximately $18,000,000 in the income from sales, caused by the drastic trade reductions in selling prices made after January 1, 1921.

The absorption of the excess cost of finished goods carried over from 1920, as stated above, resulted from following the established practice of using the cumulative average cost per unit, arrived at by taking the units on hand as of the first of the year and the cost thereof, and adding thereto the units manufactured during the year and the cost thereof.

Inventories of finished goods were not written down as of December 31, 1920, except in special cases of obsoletes, etc., because the selling prices then in effect had produced a satisfactory net profit, and it was believed that substantially such selling prices would be maintained long enough to effect liquidation. This procedure was considered economically sound, not only for this company, but for industry as a whole.

After the absorption of $10,000,000 referred to above it was found necessary to make further adjustment of the finished goods carried over from 1920, in order to bring them down to sound values, amounting to $6,113,629, of which amount $2,022,615 was charged against reserves previously created, and the remainder, amounting to $4,091,014, was charged against corporate surplus, as being definitely allocated to 1920.

In the case of raw materials and supplies the inventories as of December 31, 1920, were written down to what were then considered fair market prices. This write-off proved to be ample as to all commodities except cotton fabrics. At that time there was no real market for cotton fabrics, and it was necessary to rely upon the best information available. On this basis inventories of cotton fabrics were written down $6,425,000 as of December 31, 1920, which amount was charged against reserves previously created, and in addition $6,000,000 was appropriated from the net surplus for the year 1920 and set aside as a reserve for contingencies.

Throughout the year 1921 the market for cotton fabrics was demoralized. On the basis of replacement values during 1921 it was found necessary to use the reserve of $6,000,000 and to make a further adjustment amounting to $6,594,031, which was charged against corporate surplus, as being definitely allocated to 1920.

### Liquidation of Inventories and Liabilities

Total inventories as of December 31, 1921, amounted to $76,942,027, as compared with $123,503,030 as of the first of the year, a reduction of $46,561,003, or 37.70 per cent. Approximately 66 per cent of all the finished goods on hand as of December 31, 1921, was located at the company's sales branches.

Liabilities were decreased $23,881,798, of which $13,195,000 was in notes payable, $9,611,798 in accounts and acceptances payable and accrued liabilities, including Federal taxes and dividend provisions, and of $1,075,000 in bonds and notes retired.

In addition to the liquidation of liabilities reflected by the balance sheet as indicated above, consideration should be given to contractual liabilities representing forward commitments for raw materials and supplies. Such contractual liabilities always necessarily exist with a going concern, and while it is not customary to take them into account until after the goods have been received, nevertheless they are financial obligations and should be taken into consideration.

As of December 31, 1920, the contractual liabilities of the nature referred to, principally for cotton fabrics, amounted to $24,000,000. All of the materials represented by these commitments (except as to $300,000 worth which has not yet been required) were delivered and taken into account during 1921, in accordance with the original terms of the contracts. The corresponding contractual liabilities as of December 31, 1921, amounted to $7,200,000, all of which was at or below current market, and as to quantities covered only current requirements.

This reduction in contractual liabilities represents a further liquidation of financial obligations in the amount of $16,800,000 in addition to the reduction of $23,881,798 in liabilities reflected by the balance sheet, making a total liquidation of $40,681,798 during the year, as previously stated.

### Balance Sheet—December 31, 1921

Current assets as of December 31, 1921, amounted to $133,654,675 after writing down inventories and after deducting from accounts receivable an amount considered adequate to cover doubtful accounts. Inventories of raw materials and supplies, including crude rubber as of December 31, 1921, were valued at or below market prices. Inventories of finished goods were carried at the average cost of production, which will produce satisfactory net profits on the basis of prevailing selling prices.

Current liabilities as of December 31, 1921, amounted to $48,550,957. All accounts were met during the year as they fell due, and full advantage was taken of all cash discounts.

SURPLUS ACCOUNT

The consolidated surplus of December 31, 1921, amounted to $30 048,439, being a decrease of $17,276,941 as compared with December 31, 1920. This decrease was made up as follows:

| | | |
|---|---|---|
| Appropriation of surplus for further depreciation of cotton fabrics on hand and on commitment December 31, 1920, as hereinbefore explained | $6,594,031 | |
| Appropriation of surplus for depreciation of finished goods on hand December 31, 1920, as hereinbefore explained | 4,091,014 | $10,685,045 |
| Sundry charges, less credits, to surplus, in adjustment of transactions of prior periods, etc | | 5,989 |
| Total deductions from surplus with respect to prior periods | | $10,691,034 |
| Dividend paid April 30, 1921, on the common stock. | $1,620,000 | |
| Dividends on the preferred stock, including accrual of dividend payable January 31, 1922 (these dividends being charged against current income of United States Rubber Co.) | 5,440,000 | |
| Dividends on minority stock of subsidiary companies | 18,718 | 7,078,718 |
| | | $17,769,752 |
| Net income from operations for the year 1921, after deducting all expenses and fixed charges (and after absorbing approximately $10,000,000 excess cost of finished goods carried over from previous year and sold during the year, as hereinbefore explained) | | 492,811 |
| Net decrease in surplus | | $17,276,941 |

It should be borne in mind that if the reductions in selling prices and other disadvantages referred to could have been anticipated, they could have been provided for by appropriation of corporate surplus, applied to the further writing down of inventories as of December 31, 1920, in which event the final surplus as of December 31, 1921, would have been the same as resulted from the procedure that was followed, as hereinbefore explained.

As indicated by the balance sheet, your company closed the year in a strong financial condition. Substantial liquidation having been effected, overhead expenses having been reduced to the minimum consistent with efficient operations, and with inventories of finished goods substantially reduced and adjusted on a basis of sound values, and inventories of raw materials and supplies, including forward commitments, on the basis of current requirements, at market prices or lower, your company is in a strong financial and trade position to meet the future. The results for the future depend entirely upon general business conditions.

C. B. SEGER, Chairman.

## Management

With a few exceptions the management of the United States Rubber Co. remains in the same competent hands. Following the death of Colonel Samuel P. Colt, Charles B. Seger was elected chairman of the board and president. The board of directors continues unchanged except for the omission of Colonel Colt, James B. Brady and George R. Deshler, and the addition of Newcomb Carlton. H. Stuart Hotchkiss has been elected vice-president in general charge of overseas activities, and George S. Shugart is vice-president of the United States Tire Co. in charge of sales.

## The Beacon Falls Rubber Shoe Co.

About a year ago The Beacon Falls Rubber Shoe Co., of Beacon Falls, Connecticut, in which for many years this company had a minority stock interest, became financially embarrassed. Shortly thereafter its president, Mr. Tracy S. Lewis, died. This company was appealed to by the management, the creditor banks and others interested, to aid in its reorganization. As its failure would have been detrimental to the general business situation at that time, in addition to involving a loss in the investment in its capital stock, it was felt that action should be taken.

Accordingly a plan was arranged by which substantially all outstanding notes of Beacon Falls company, to the principal amount of $3,010,000, were purchased at their face value by this company under an agreement that payment of the notes shall not be enforced prior to May 31, 1926, unless in the meantime The Beacon Falls Rubber Shoe Co. can safely pay them. The purchase price is payable on May 31, 1923, or earlier at the election of this company, and the payment at its option may be either in its first and refunding mortgage 5 per cent bonds at par or in cash. Holders of preferred and common stock of the Beacon Falls company have deposited their stock, this company agreeing at the end of the five-year period to buy or find a purchaser for the stock on the basis of $80 per share for the preferred stock and $20 per share for the common stock. This company is to pay meanwhile, by way of interest, $5 per year per share on the deposited preferred stock and $2 per year per share on the deposited common stock, and against these payments is to receive any dividends which may be paid on the stock by the Beacon Falls company during that period. As a part of the general plan a management agreement has been made under which this company is to have the management of the Beacon Falls company for five years and is to receive as compensation one-half of the net profits during that period.

The directors feel that the plan will work out satisfactorily and without eventually involving this company in liability. If any stockholder desires more detailed information than is afforded by the foregoing general summary, a copy of the entire plan and agreement will be sent upon request.

## The Comptroller's Report

### United States Rubber Co. and Subsidiary Companies

Consolidated General Balance Sheet—December 31, 1921

ASSETS

| | | |
|---|---|---|
| Cash | $12,998,904.65 | |
| Accounts receivable | 41,164,289.15 | |
| Notes and loans receivable | 2,549,454.19 | |
| Finished goods | 50,928,599.19 | |
| Materials and supplies, including goods in process | 26,013,427.56 | |
| Total current assets | | $133,654,674.74 |
| Notes receivable of employes given for purchase of common stock and secured by such stock | $7,129,453.78 | |
| Common stock of United States Rubber Co. held under service contracts and agreements | 2,305,336.49 | |
| Securities owned and held in insurance fund | 2,442,031.93 | |
| Securities owned, including common stock of United States Rubber Co. held by a subsidiary company | 4,320,683.68 | |
| Plants, properties, and investments, including rubber plantations | 186,396,252.51 | |
| Prepaid and deferred assets | 4,143,547.19 | 206,737,305.58 |
| Total assets | | $340,391,980.32 |

LIABILITIES, RESERVES AND CAPITAL

| | | |
|---|---|---|
| Accounts payable, including acceptances payable for importation of crude rubber | $9,423,368.09 | |
| Accrued liabilities | 2,917,588.58 | |
| Notes payable | 36,210,000.00 | |
| Total current liabilities | | $48,550,956.67 |
| United States Rubber Co., first and refunding mortgage gold bonds due 1947 ($65,551,800 5 per cent and $24,750,000 6 per cent) | $91,301,800.00 | |
| less treasury bonds deposited as security for: | | |
| United States Rubber Co. 5-year 7 per cent secured gold notes..$9,000,000 | | |
| United States Rubber Co. 10-year 7½ per cent secured gold notes. 24,750,000 | 33,750,000.00 | |
| | $57,551,800.00 | |
| United States Rubber Co. 5-year 7 per cent secured gold notes, due December 1, 1923. | 6,000,000.00 | |
| United States Rubber Co. 10-year 7½ per cent secured gold notes, due August 1, 1930 | 19,800,000.00 | |
| Canadian Consolidated Rubber Co., Limited, 6 per cent gold bonds, due 1946 | 2,600,000.00 | 85,951,800.00 |
| Total liabilities | | $134,502,756.67 |
| Reserve for depreciation of property and plant | $16,738,861.86 | |
| Reserves for insurance | 2,975,980.36 | |
| General reserves | 1,649,666.95 | |
| Reserve for dividend on preferred stock, payable January 31, 1922 | 1,380,000.00 | |
| Total reserves | | 22,744,509.16 |
| Capital stock—preferred ..... $69,000,000 | | |
| less amount held by a subsidiary company | 3,890,000 | $65,110,000.00 |
| Capital stock—common | 81,000,000.00 | |
| Minority—Canadian Consolidated Rubber Co., Ltd., stock | 277,000.00 | |
| Total capital stock | $146,387,000.00 | |
| Fixed surpluses—subsidiary companies | 6,709,275.22 | |
| Surplus | 30,048,439.27 | |
| Total capital stock and surpluses | | 183,144,714.49 |
| Total liabilities, reserves and capital | | $340,391,980.32 |

WILLIAM O. CUTTER, Comptroller.

# Activities of the Rubber Association of America

## Meeting of Board of Directors

THE Board of Directors met for the April regular meeting at the Lotos Club, on April 20, at 1 p. m. At this meeting there was a very good attendance and a considerable number of routine matters was handled.

## Mechanical Rubber Goods Division

The Specification Committee of the Mechanical Rubber Goods Division met at the association offices on April 18 and devoted the morning session to a conference with a sub-committee of the American Railroad Association, which is cooperating with the Mechanical Goods Specification Committee in working out specifications for railroad mechanical goods. In the afternoon a routine meeting of the Specification Committee was held and progress effected in many matters upon which the committee has been working.

## Tire Manufacturers' Division

The regular monthly meeting of the Tire Executive Committee was held April 19, beginning at 12.30 at the Yale Club. There was an unusually satisfactory attendance and the committee devoted the entire afternoon to discussion and action on a number of important matters.

The Cycle Tire Committee of the Tire Manufacturers' Division met April 19, and devoted most of its attention to a discussion of the possibility of effecting a change in the adjustment conditions in connection with bicycle tires.

## Foreign Trade Division

The Foreign Trade Division held a meeting April 21, at Washington, D. C. The meeting was called at Washington in order that members of the division might see how the commodity divisions of the Bureau of Foreign and Domestic Commerce are organized and operated. Herbert Hoover, Secretary of Commerce, addressed the meeting and several of the bureau heads in the Department of Commerce also attended and discussed their plans and answered questions. The meeting was considered very satisfactory from every point of view.

## Industrial Relations Committee

A meeting of the Industrial Relations Committee was held on April 26 and 27, when plans for the renewal of the activity of that committee were made. General employment, wage and hour conditions naturally constituted an important part of the discussion by the committee.

## State Regulation of Motor Vehicle Common Carriers

The Motor Vehicle Conference Committee is a legislative research and educational body jointly organized and maintained by the National Automobile Chamber of Commerce, the Motor and Accessories Manufacturers' Association, the A. A. A., the National Automobile Dealers' Association, the Trailer Manufacturers' Association and The Rubber Association of America. It has recently distributed a pamphlet entitled, "State Regulation of Motor Vehicle Common Carriers," which constitutes a preliminary report of State laws in force on January 1, 1922, and of bills pending before State Legislatures in session on March 1, 1922. It represents probably the only survey of its kind and shows the extent of the tendency to regard the automotive industry as the natural prey of regulatory law proponents.

In this connection, it is interesting to know that the Motor Vehicle Conference Committee organization was successful in helping to defeat Kentucky House Bill No. 257, which would have required that the year and month of manufacture be stamped on all tires sold in the State of Kentucky.

## Promotion of Straightside Tires in Foreign Countries

As a part of the general campaign for the advancement of the straightside tire in foreign countries, the Foreign Trade Division of The Rubber Association has addressed to all American chambers of commerce abroad, a letter outlining the facts in connection with the development of the straightside tire in the United States. A copy of the Association's pamphlet, "Why Straightside Tyres Are Better," was enclosed with each letter. This pamphlet is to be issued in twelve different language editions for distribution in foreign countries and the British edition has already been printed and partly distributed.

## Statistics Compiled from Questionnaire Covering the Second Six Months of 1921[1]

*Copyright, 1922, by The Rubber Association of America, Inc.*

| | Reported by Manufacturers Who Also Reclaim (30) | Reported by Reclaimers Solely (9) | Total Pounds |
|---|---|---|---|
| Reclaimed rubber produced from raw and cured scrap.....*pounds* | 18,383,526 | 24,597,893 | 42,981,419 |
| Scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber....*pounds* | 24,294,659 | 33,155,798 | 57,450,457 |

NUMBER OF POUNDS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

| PRODUCT | Number of Pounds of Crude Rubber Used | Total Sales Value of Shipments of Manufactured Rubber Products |
|---|---|---|
| Tires and Tire Sundries: | | |
| Automobile and motor truck pneumatic casings | 121,380,909 | $222,245,268 |
| Automobile and motor truck pneumatic tubes | 37,905,200 | 32,792,325 |
| Motorcycle tires (casings and tubes) | 167,559 | 522,996 |
| Bicycle tires (single tubes, casings and tubes) | 713,452 | 1,578,018 |
| All other pneumatic casings and tubes, not elsewhere specified | 5,600 | 26,370 |
| Solid tires for motor vehicles | 13,311,292 | 11,490,732 |
| All other solid tires | 292,627 | 792,037 |
| Tire sundries and repair materials | 2,588,065 | 5,530,389 |
| Total—Tires and tire sundries | 176,364,704 | $274,978,135 |
| Other rubber products: | | |
| Mechanical rubber goods | 10,757,733 | $27,021,800 |
| Boots and shoes | 13,492,982 | 49,700,103 |
| Insulated wire and insulating compounds | 1,577,618 | 7,263,306 |
| Druggists' sundries, medical and surgical rubber goods | 1,771,052 | 5,987,779 |
| Waterproof cloth, clothing, and rubber sheeting | 1,990,341 | 7,735,055 |
| Hard rubber goods | 1,289,426 | 2,275,785 |
| Heels and soles | 4,004,057 | 7,444,064 |
| Miscellaneous, not included in any of above items | 2,372,785 | 6,023,142 |
| Total—Other rubber products | 37,255,994 | $113,451,034 |
| Grand total—all products | 213,620,698 | $388,429,169 |

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR UNITED STATES PORTS, DECEMBER 31, 1921

| ON HAND | Plantation | Pará | All Other |
|---|---|---|---|
| Manufacturers.....*long tons* | 55,388 | 3,356 | 9,907 |
| Importers and dealers | 24,789 | 842 | 488 |
| Total.....*long tons* | 80,177 | 4,198 | 10,395 |

Grand total—On hand, 94,770 long tons

| AFLOAT | Plantation | Pará | All Other |
|---|---|---|---|
| Manufacturers.....*long tons* | 7,575 | 192 | 5 |
| Importers and dealers | 25,801 | 1,198 | 218 |
| Total.....*long tons* | 33,376 | 1,390 | 223 |

Grand total—Afloat, 34,989 long tons

[1]The number of rubber manufacturers reporting data for the second half of 1921 was 235; the number of crude rubber importers and dealers reporting data was 57; and the number of reclaimers (solely) reporting data was 9. The total daily average number of employes, on basis of third week of July, 1921, was 133,186

## Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires, Etc.

| | Pneumatic Casings | | | | Inner Tires | | | | Solid Tires | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | No. Mfrs. Reporting | Inventory | Production | Shipments | No. Mfrs. Reporting | Inventory | Production | Shipments | No. Mfrs. Reporting | Inventory | Production | Shipments |
| March, 1921 | 46 | 4,597,103 | 1,163,314 | 1,614,651 | 48 | 5,044,861 | 1,346,483 | 1,643,690 | 12 | 283,800 | 28,710 | 43,926 |
| April, 1921 | 49 | 4,527,445 | 1,651,418 | 1,785,951 | 51 | 4,916,772 | 1,762,122 | 1,983,571 | 12 | 269,985 | 28,859 | 42,080 |
| May, 1921 | 59 | 4,451,668 | 2,100,917 | 2,085,882 | 57 | 4,751,880 | 2,210,040 | 2,342,567 | 12 | 264,663 | 35,156 | 40,122 |
| June, 1921 | 63 | 4,154,456 | 2,313,265 | 2,643,850 | 60 | 3,835,098 | 2,359,928 | 3,232,673 | 11 | 240,336 | 28,395 | 49,867 |
| July, 1921 | 63 | 3,892,037 | 2,570,524 | 2,757,581 | 61 | 3,122,815 | 3,020,981 | 3,603,248 | 11 | 220,003 | 35,123 | 55,678 |
| August, 1921 | 66 | 3,934,853 | 3,043,187 | 2,894,442 | 64 | 3,649,319 | 4,430,152 | 3,804,060 | 11 | 216,367 | 55,694 | 66,866 |
| September, 1921 | 63 | 3,340,798 | 1,929,268 | 2,047,929 | 62 | 3,827,830 | 3,274,822 | 2,645,758 | 11 | 161,832 | 37,441 | 50,276 |
| October, 1921 | 64 | 3,545,030 | 1,928,271 | 1,675,169 | 64 | 4,732,016 | 2,843,918 | 2,016,371 | 10 | 163,299 | 46,274 | 45,911 |
| November, 1921 | 64 | 3,908,342 | 1,756,555 | 1,342,519 | 63 | 5,203,568 | 2,126,211 | 1,540,299 | 10 | 173,451 | 43,537 | 34,556 |
| December, 1921 | 64 | 3,696,519 | 1,839,738 | 1,980,264 | 64 | 4,731,021 | 2,070,098 | 2,522,710 | 10 | 168,515 | 40,478 | 39,520 |
| January, 1922 | 66 | 4,174,216 | 2,055,134 | 1,596,806 | 66 | 5,246,647 | 2,343,393 | 1,889,724 | 11 | 181,769 | 40,224 | 33,294 |
| February, 1922 | 66 | 4,691,329 | 2,084,308 | 1,562,365 | 65 | 6,141,956 | 2,596,774 | 1,702,583 | 11 | 183,448 | 39,492 | 36,805 |

*Compiled by The Rubber Association of America, Inc.*

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse branch, or on a consignment basis, or abroad.

## Interesting Letters from Our Readers

### Mulberry Hevea

To the Editor:

Dear Sir: The guiding genius who presides over the destinies of The India Rubber World has been taking a number of flights into the world of fancy of late, in the airship of his india rubber imagination.

The latest one suggests the possibility of producing a hybrid between one of the great Brazilian rubber-producing trees and the northern red mulberry, that would grow in the United States and yield latex of sufficient rubber content to make cultivation worth while.

What I should especially like to know is whether or not Mr. Pearson expects the fruit of such a tree to be a mulberry-flavored, vegetable chewing gum of a beautiful red color not unlike that of the old-fashioned rose-flavored soft gum drops?

New York. J. C. Smith.

As chewing gum is made of a gutta and not of rubber, no such hope is entertained. A hybrid resulting from the crossing of the chicle tree, the *Acras sapota*, and the sugar maple is advised.—The Editor.

### Native Porous Plasters

To the Editor:

Dear Sir: Speaking of mats made of the bark of the Central American rubber tree, the Castilloa, were you aware that medicinal plasters were made of the bark of a rubber tree by South American natives? I do not know what the tree is botanically. It, however, has a tough bark arranged in layers with a rubbery substance on one side. Cut off in squares it makes a fine plaster. Curiously enough almost every tree is the home of a pair of birds that feed on insects in the bark, boring holes at regular intervals so that often the plasters are perforated as well as the ordinary drug store type.

Do you happen to know the name of the tree and what the birds are?

Boston, Massachusetts. Samuel Sinclair.

It is rather difficult to identify a tree botanically with only an Indian tale to go by. We frankly confess ignorance concerning it. With regard to the bird that acts as a perforating machine just as a suggestion Johnson & Johnson are the pioneer makers of porous plasters. Their trade mark known the world over is "J. & J." The bird is probably a jay and there being a pair, they are Jay & Jay.—The Editor.

## New Trade Publications

An unusual and well-illustrated little booklet, explaining the characteristics and especial uses of "Condor" rubber belting, is being sent out by the manufacturers of this product, the Manhattan Rubber Manufacturing Co., with executive offices and factories at Passaic, New Jersey. This particular make of belting is said to be peculiarly well-adapted for agricultural uses, having been prepared especially for thresher and farm service. Methods of applying and caring for it, with detailed information concerning belt splicing, are given in this little publication. Another variety, needing no splicing, is also manufactured by this company, and is especially designed for use as a tractor and engine belt. Still other products of the Manhattan company, which can be utilized in other industries, are "Manhattan" pulley lagging, "Browndel" brake lining, "Delhi" red sheet packing, "Fulton" spiral packing, and several varieties of garden and radiator hose. An interesting feature of this booklet is a list of prices of rubber belting, as adopted by the Mechanical Rubber Goods Manufacturers' Division of The Rubber Association.

Bulletins of Hard Rubber Pumps and Fittings designate a finely-illustrated series of bulletins issued under single cover by the Chemical Equipment Division of the American Hard Rubber Co., 11 Mercer street, New York, N. Y. These describe the various types of circulating hard rubber pumps, pipes, fittings and utensils manufactured by this company for use in handling acids, caustics or other corrosive solutions. These pumps are both centrifugal and reciprocating.

An illustrated bulletin, quoting net cost prices on many automotive products and applicable to "Culp-Plan" associated stores only, has been recently issued by George K. Culp, Inc., 56 West 45th street, New York, N. Y. A "Get Acquainted" agreement explains to unassociated dealers the sales system maintained by this company.

The "Chemical Laboratory Apparatus Catalog," issued by the Chemical Rubber Co., Cleveland, Ohio, is well-indexed, classified and illustrated. All the standard and a number of special pieces of apparatus are listed, described and priced for convenience in placing orders.

An article entitled "The Properties of Air" is the main feature of the March-April issue of *The Weather Vein*, a little illustrated publication issued monthly by the Carrier Engineering Corporation, offices and laboratories at 750 Frelinghuysen avenue, Newark, New Jersey. The aim of this organization is to apply the scientific principles of air conditioning to the various practical requirements of industry. The sketch on the back cover of this issue of *The Weather Vein* represents the

installation of the Carrier system in the new unit at Brighton Mills, Inc., Allwood, New Jersey, tire fabric manufacturer. The Carrier idea of "manufactured weather" had been so successful in the old mill that it was built into the new one as an integral part of the construction.

A house-organ entitled *Chords*, to be published monthly in the interest of tire dealers, is being sent out by The Odell Rubber Co., South Bend, Indiana, manufacturer of tires and tubes. In this little publication is included a brief account of the internal expansion cure process by which oversize Odell Cords are built. George W. Odell is president and founder of the company, and Rudolph Ackerman is vice-president and business manager.

## The Editor's Book Table

"TWENTY-SECOND YEAR BOOK." ISSUED BY THE RUBBER Association of America, Incorporated. Prepared by the general manager and secretary. Paper, 52 pages, 6 by 9 inches.

This year book of The Rubber Association is divided into two sections, the first giving the personnel of the organization as of March 1, 1922; the constituency of permanent committees and divisions; and the membership roll of the association. The charter, constitution and by-laws, a list of the officers and directors of the association since its organization in 1900, and a necrology, appear in the second section. A brief prefatory note, outlining the main facts in the association's history, is an interesting feature.

"OFFICIAL AMERICAN TEXTILE DIRECTORY, 1921." TWO EDITIONS. Compiled by *Textile World*. Bragdon, Lord & Nagle Co., New York, N. Y. Cloth, 968 pages, 5½ by 9 inches.

The "Official American Textile Directory," which also includes the Yarn Trade Index, is a most practical and comprehensive publication, invaluable to those associated with textile industries. Compiled annually by the *Textile World*, it is regularly revised by personal canvass and official reports from the trade, giving full information regarding approximately 9,500 establishments. The volume is divided into six main sections, with numerous subdivisions, and data arranged both alphabetically and geographically. A final alphabetical index lists all the textile mills and manufacturers in the United States and Canada.

Two editions annually are published, the large size for office use and a smaller flexible one for travelers. The vest-pocket edition of this directory is published in three sections: the New England States and Canada; Middle Atlantic States; Southern and Western States.

"TRADING WITH ASIA." BY FRANK R. ELDRIDGE, JR., CHIEF OF the Far Eastern Division of the United States Bureau of Foreign and Domestic Commerce, and lecturer on Far Eastern Economic Survey in the School of Foreign Service, Georgetown University. D. Appleton & Co., New York, N. Y. Cloth, 453 pages, 5 by 8 inches.

A great deal of historical as well as industrial information has been supplied in this useful volume which, arranged in four parts, and with numerous subdivisions, includes China and Japan; the Philippines and the Dutch East Indies; British India, Burma, and Ceylon; and Malaysia, French Indo-China, and Siam. Sections devoted to the rubber industry are interesting and authoritative, while in an introductory chapter are some important suggestions under such headings as "Difficulties Confronting the Prospective Trader"; "Character of the Market"; "Economic Interdependence of Asiatic Countries"; and "Effect of War on Far Eastern Colonial Trade Policies." The author modestly states that his book "is intended to serve as a primer on Far Eastern trade," and also says that his work "is built upon the theory that a knowledge of commerce is essentially a knowledge of the reasons why certain commodities dominate the trade of certain regions." Three interesting maps, particularly a large one supplied by the Irving National Bank, New York, N. Y., add to the value of the work as a whole.

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into Venezuela, Paraguay, and Belgium, France, Netherlands, and the United Kingdom." Six separate monographs prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

A great deal of interesting and most important information is included in these six publications, the statistics representing the export trade of the United States being of especial value. In reading these figures, one is impressed by the steadily-increasing growth of this country's industry, which is here so much in evidence notwithstanding the business depression of the year 1921.

### ACCELERATOR INDEX

C. W. Bedford, research chemist and chairman of the Rubber Division of the American Chemical Society, has specialized in the study of organic vulcanization accelerators. His papers on the subject are widely known and highly valued by rubber chemists at home and abroad. It is a matter of great interest that he is continuing his researches on accelerators and for some years has had in preparation a complete bibliography and subject index to include all available information regarding organic accelerators and the vulcanization of rubber by sulphur or other chemicals.

Doctor Winklemann, of The B. F. Goodrich Co., is cooperating with Doctor Bedford to make the index full and complete.

THE INDIA RUBBER WORLD desires to aid the authors of this important work by giving publicity to their plans and appeal for suggestions and information from all chemists and rubber technologists who may be disposed to communicate hitherto unpublished data or tests. Communications should be send direct to C. W. Bedford, 319 Vaniman street, Akron, Ohio, who will be pleased to receive and reply to them.

### OPTIMISM WINS

A little volume of inspiriting and thoroughly optimistic rhymes, under the title of "Up and Doing," has been dedicated by the author, C. P. McDonald, vice-president of the advertising agency of Frank Presbrey Co., New York, N. Y., to Seneca G. Lewis, vice-president and general manager of the Pennsylvania Rubber Co., Jeannette, Pennsylvania.

The introductory note states that "this little volume is most affectionately dedicated to Seneca G. Lewis, who has daily denied the cant of can't, and who ever spoke of courage when the heart refused to sing."

### SPLIT-SECOND TIME STUDY WATCHES

Certain instruments as aids in time and motion study experiments have become a necessity in modern plants, where waste must be eliminated, and exact costs determined.

Split-Second Watch

The split-second time study watch illustrated has a double hand as its chief feature. This permits taking two closely related operations at the same time, comparative observation of two different workmen or machines, and also, in the case of an interruption, shows not only the time consumed before the interruption occurred, but the total time taken by the operation and the amount of waste time entailed by the operation itself. A small hand near the top of the dial covers a period of 30 minutes and each subdivision of this dial shows the lapse of a minute and indicates the number of complete revolutions that the large hand has made.—Stein & Ellbogen Co., 31 North State street, Chicago, Illinois.

# New Goods and Specialties

## Inflatable Rubber Doll in Easter Parade

Toy shops and dealers having any striking novelty which they desire to advertise will do well to introduce it to the much-discussed "flapper." If it takes her fancy, she and her sisters will boom it, even unconsciously, as evidence of which, take a look at "Blimbo," otherwise known as the "Hula-Hula Doll," as he smilingly appeared in the Easter parade on the boardwalk at Atlantic City.

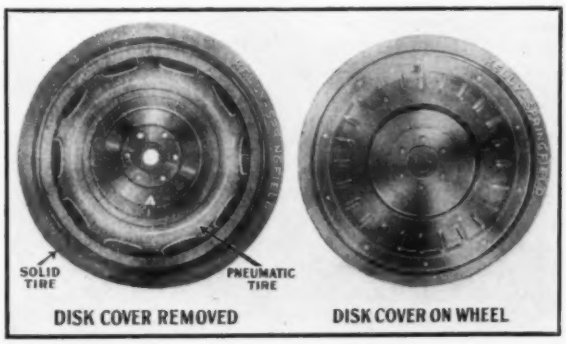
*Underwood & Underwood, N. Y.*

**"Blimbo, the Hula-Hula Doll," on Parade**

This doll's combined clothing and decorations, of true Hula-Hula type, consist of fringes, earrings and bracelets, which, like his warm brown "skin" and his topknot, are all made of rubber. Within the topknot is concealed the valve through which the doll is inflated. This is a well-made toy and is being displayed in drug stores in the large cities, where it attracts much attention when properly inflated and propped up or suspended.—The Seamless Rubber Co., New Haven, Connecticut.

## Truck Wheel That Is Punctureproof

A new punctureproof truck wheel has an inflated pneumatic tire around the hub and a solid tire around the rim. A cover plate of metal protects the pneumatic tire from injury and dirt and is easily removable. The valve stem is located inside this cover plate and the tire should be tested once a month to be sure that the air pressure is sufficient. Any deflation will be indicated in the same way as if the tire were on the ground.—Baker Steam Motor Car and Manufacturing Co., Inc., 1926 Broadway, New York, N. Y.

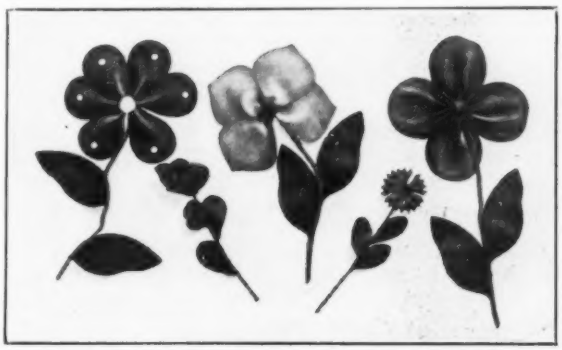



**"Dobbins" Pneumatic Punctureproof Truck Wheel**

## Rubber Flowers on German Bathing Caps

From Germany come the rubber flowers in the photograph reproduced here, which are applied to bathing caps. The large petals and leaves are cut from thin sheet rubber. The stems are twisted strips of rubber, either wound and cemented onto itself or around a core of wire. The daisy petals and the stamens of the large righthand flower are filled with air included between the two sheets of rubber from which they were died out, the edges being joined by the pressure.

The little rose with its bud, and some of the larger flowers, are a beautiful red, while others are blue, yellow, or white, with contrasting centers and green leaves and stems.—Radium Gummiwerke G. m. b. H., Köln-Dellbrück, Germany.



**German Rubber Flowers for Bathing Caps**

## To Lock the Bottle with the Cork

The manufacturer of bottlers' supplies who has long sought a form of cork that would meet the need of perfumers and others who put up expensive liquids in bottles, will welcome the key-locked cork, a British invention, made in England. This is a combination metal and rubber stopper with a lock, and it is attachable to either bottles or decanters. When the key is turned in the lock, the metal core expands and forces the rubber part against the neck of the bottle, making it impossible to remove the stopper until it is unlocked with the key.—Martin & Martin, Inc., 618 Fifth avenue, New York, N. Y.; 103 Gloucester Road, South Kensington, London, W. E., England.

**Key-Locking Cork**

## "Aristo" Line of Transparent Nipples

Dealers and jobbers in druggists' sundries will appreciate the attractive appearance of the "Aristo" transparent nipples and soothers for infants. One style of soother is of the so-called jelly-filled type and another is corrugated.

The same manufacturer also makes finger cots, toy balloons in both round and airship styles, and surgeons', household, and linemen's rubber gloves.—Transparent Rubber Goods Co., Limited. Toronto, Ontario, Canada.

### "Aero Center" of New Baseball Is Rubber

A new baseball has a perfectly spherical center made of specially-compounded rubber of great resiliency and toughness. This center is wound with wool yarn of high quality, made purposely for this use. The winding is done under even tension on specially-built winding machines to maintain the perfect sphericity necessary to produce a balanced ball. The official playing rules of professional baseball clubs provide that no ball used shall weigh less than 5 or more than 5¼ ounces, nor measure less than 9 or more than 9¼ inches in circumference. The "Aero Center" baseball conforms to these requirements and the manufacturer claims that it will not get out of shape or become lopsided.—Thos. E. Wilson & Co., 701 North Sangamon street, Chicago, Illinois.

"Aero Center" Baseball

### Gogglette Rubber-Cushioned

A comfortable and practical outdoor gogglette, known as the "Luxor," has inflated rubber cushions at the edges of the ventilated aluminum eye-cups, while the nosepiece is adjustable. The angle of vision is wide and the lenses supplied may be amber or colored instead of white, or made according to prescription. The "Luxor Gogglette" is held on by adjustable elastic straps. Dealers in fittings for automobilists, aviators, and others who desire dust protection with comfort for the eyes, will probably find this item has unusual advantages.—E. B. Meyrowitz, Inc., 520 Fifth avenue, New York, N. Y.

The "Luxor Gogglette"

### Rubber-Soled Carriage Boot for Women

Along with the revival of other old styles comes the carriage boot, now called the "Sedan" by the only Canadian rubber-footwear manufacturer making this style of boot. The heel and sole are of rubber instead of leather, the lining is quilted, and the boot itself is of velvet, fur-trimmed. Dealers in northern latitudes will appreciate a boot of this sort for patrons who ride in automobiles, yet need some adequate protection for dainty footwear between the car and the doorway of their destination.—Ames Holden McCready Limited, Montreal, Quebec, Canada.

Women's "Sedan"

### Storage Battery Filling Device

The illustration shows a device comprising a rubber funnel and a glass tube for filling storage batteries with liquid and testing its height. The tube is inserted in the top of the storage battery cell and permitted to descend until it reaches the level of the top edges of the battery plates. The liquid will rise to its level in the tube and can be held at level by compressing the rubber knob on the funnel neck. The depth of the liquid can then be read on the scale.—Adolph J. Nuss and Frederick A. Parker, Williamsport, Pennsylvania. United States patent No. 1,399,868.

Storage Battery Funnel

### "Royal" Tubes Withstand Severe Tests

A new type of inner tube which, it is said, has been uninjured by the severest tests, has several interesting features. One is that age has little effect on the quality of the rubber used, while the tube is not hurt by ordinary heat. Vulcanization of repairs has no weakening effect on the adjacent tube wall, while the tube acquires no "permanent stretch," and will fit back into the casing without wrinkling even though it has been used for some time. Injuries due to punctures and blowouts are greatly restricted, and seldom extend beyond the area of injury to the casing. The manufacturer claims to have produced a tube which has the same general excellence as its Royal cord tire.—United States Rubber Co., 1790 Broadway, New York, N. Y.

### "Larkide" Sole Matches Leather, Canvas, or Fabric

"Larkide," a resilient, flexible soling containing rubber, having a permanent non-slipping nap, and inexpensive.—The Larkide Co., 201 Devonshire street, Boston, Massachusetts.

### Pneumatic Cord Tire for Light Trucks

A new tire designed for use on light trucks and passenger busses is the "Victor Cord," made in two sizes—34 by 5 and 36 by 6-inch, embodying a modification of the Victor non-skid tread design. This is the result of several months of development and experimental work. Other sizes are also being developed, and gray tubes in the same sizes are being added to complete the manufacturer's line.—The Victor Rubber Co., Springfield, Ohio.

"A. T. C." Tire "Victor Cord"

### Cord and Fabric Tires of Same Design

The cord and fabric tires being manufactured under the name "A. T. C." have a deep, high-shouldered, extra heavy tread, cured in open steam. The breaker is made of long-fiber cotton cords, impregnated with good-quality rubber and the cushion is of live rubber. The carcass is made from long-staple, combed Egyptian cotton fabric and cord, impregnated with pure rubber, and the bead is of 5-ply wire, non-stretching.—American Tire Corporation, Niles, Ohio; sales department, 258 North Broad street, Philadelphia, Pennsylvania.

### Rubber Apron with New Strap Feature

Dealers in rubber goods for the housewife will appreciate the new feature in the "Never-Wet" rubberized gingham apron. It has straps over the shoulder instead of the more usual tapes, and, instead of tying, these straps cross in the back and fasten with snap buttons at the waist line of the apron. The apron is made in dark blue, lavender and pink checks, as well as in white.

"Never-Wet" Apron

Other specialties put out by the same manufacturer include sanitary goods for women, infants' bloomers, and a black rubber apron for men. This apron is made of specially treated sheeting, rubberized on both sides, and will stand a great deal of hard usage. It comes in two sizes, 41 by 29 inches and 43 by 33 inches.—Bergen Manufacturing Co., 413 Locust street, Philadelphia, Pennsylvania.

### Rubber Shoe for Policemen, Postmen, and Truckmen

The "Traffic" rubber contains, it is claimed, successive layers of the best high-grade rubberized fabric and live rubber, which give a sturdy bottom, while the specially reenforced toe and heel add balance. Dealers should find in men who walk a great deal good buyers for the "Traffic."—Cambridge Rubber Co., Cambridge, Massachusetts.

The "Traffic" Rubber

### New Clincher Tire and First "Semi-Pneumatic"

The latest addition to the Goodrich line of tires is the "55" clincher fabric shown here, which is made in two sizes—30 by 3 and 30 by 3½-inch—for small cars. It has a thick anti-skid tread scientifically designed for safety. This tire is being nationally advertised at an attractive low price, while the manufacturer's standards give full assurance of quality.

Goodrich "55"

"Semi-Pneumatic"

The other illustration pictures the first steel-base, hollow-center truck tire built in America, called the "Semi-Pneumatic." The tread is grooved to provide a non-skid feature and the side blocks give maximum traction. The manufacturer recommends this tire as combining the resiliency of the pneumatic with the durability of the solid, claiming that it will reduce the wear and tear of rough, uneven roads and lessen vibration, thus eliminating the danger of breakage of fragile loads. The same manufacturer's "Diamond Cord" was described and illustrated in the March 1 issue of THE INDIA RUBBER WORLD.—The B. F. Goodrich Rubber Co., Akron, Ohio.

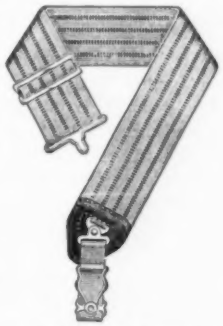
### Windshield Cleaner Electrically-Operated

Accessory dealers and others will appreciate the novelty of the "Storm-King" automobile windshield cleaner. It is operated by a chain drive geared to a small motor operated from the starting and lighting battery, and consumes but 1½ amperes of current. The rubber squeegee blade cleans all the way across the windshield. The device may be had in any desired length, in black japanned or nickel finish, and is easily installed without a mechanic. It may be used on either closed or open cars and does not interfere with opening or closing the windshield.—The Doughty Manufacturing Co., 273 Lafayette street, New York, N. Y.

"Storm-King" Windshield Cleaner

### Garter That Fits Either Leg

A new item for the men's furnishing departments and notion goods counters is the "Eitherway" garter that is made of wide webbing and provided with a catch that moves either way so that each garter may be worn on either leg.—The Russell Manufacturing Co., Middletown, Connecticut; 349 Broadway, New York, N. Y.



"Eitherway" Garter

### "Le Roquet" Made in France

The barking-dog toy illustrated in THE INDIA RUBBER WORLD, June 1, 1921, has proved to be as popular as almost any other contemporaneous rubber toy. It has been imitated and infringed upon, but still holds its own with buyers who appreciate real French workmanship.—Vve. Besse & Gilaz, 34 rue de Montmorency, Paris, France.

### Rubber-Tired Wheels on Small Trucks and Casters

Light trucks in banks, factories, offices, hotels, stores, libraries, and other places may be operated with comparative silence if equipped with the rubber-tired ball-bearing "Colson" wheel, in either 5 or 10-inch size. The small size is also applicable to bed casters. The tires are made from a special rubber compound and will not stretch or break off the rim. By taking apart the housings, these tires are easily replaced when worn out.—The Colson Co., Elyria, Ohio.

Rubber-Tired "Colson" Wheel

### Willard All-Rubber Battery for Radio

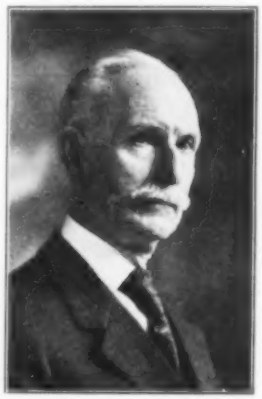
The Willard all-rubber battery, now standard equipment on 191 makes of cars and trucks, has been adapted for use with radio equipment and is being put out by the manufacturer with the same kind of thread-rubber insulation used in its automobile batteries.—Willard Storage Battery Co., 246-286 East 131st street, Cleveland, Ohio.

# The Obituary Record

## Prominent Rubber Machinery Manufacturer

JOHN ROYLE, younger son of the founder of John Royle & Sons, machinery manufacturers, Paterson, New Jersey, died at his home in that city on March 24, 1922, aged 71 years. His death followed a stroke suffered about a week previously.

Mr. Royle was born in Paterson, New Jersey, on July 16, 1850. Attending the public schools until he reached the age of twelve years, he entered the employ of *The Paterson Press* as a press-room helper. Leaving the newspaper office he went to work for the late Thomas Wrigley, and later secured employment with the *Paterson Guardian* as engineer and pressman, often helping to deliver the paper to customers after the edition had been run off.



John Royle

In 1868, after some time spent in further study, he entered the Royle machine shop and soon found his life-work there as its superintendent. Many original methods were installed and perfected by him to meet the problems of manufacturing the highly specialized types of machinery for several different industries, which the firm produced. Notable among these are the Royle tubing machine, Royle insulating machine and the De Laski circular loom, developed very largely by the inventive genius of his brother, Vernon Royle, Sr., and which are known to the rubber industry of the entire world.

Mr. Royle was a man of marked executive ability and a natural leader of men, who held the confidence of his associates and the esteem of his employes. His death is a loss to the machinery industry and to Paterson, and is mourned by many warm friends in the First Congregational Church and the Masonic bodies of that city.

He is survived by his widow, Isabelle Kidd Royle, and two children, Agnes, wife of the Reverend Elias Van Ardsdale, of Hawthorne, New Jersey, and William Kidd Royle, who is connected with the firm of John Royle & Sons; also by his elder brother, Vernon Royle, Sr., and three grandchildren.

Funeral services were held at his late residence in Paterson and interment was made at Cedar Lawn Cemetery in that city.

## A Popular Canadian Rubber Executive

The Canadian rubber industry has lost one of its foremost leaders in the death, April 15, 1922, of Talmon H. Rieder, president of Ames Holden McCready Limited, Montreal, Quebec, Canada.

Mr. Rieder's connection with the rubber industry dates from 1900 when he became bookkeeper and director of the Berlin Manufacturing Co., Limited, Berlin, Canada. Three years later he organized the Merchants Rubber Co., Limited, built the plant at Berlin and became managing director. In 1907 these companies were absorbed by the Canadian Consolidated Rubber Co., Limited, and Mr. Rieder was made vice-president and manager of the two companies at Berlin.

In 1908 he was elected vice-president of the Canadian Consolidated Rubber Co., Limited, became also its general manager, in 1915 and two years later was elected president. Such a record of achievement within the space of 17 years is proof sufficient of his indomitable energy, untiring zeal and executive ability. Mr. Rieder displayed talent as an inventor as well as an executive, several patents having been granted to him for practical improvements in the rubber manufacturing field.

In 1917, Talmon H. Rieder, with others, incorporated the $3,000,000 Ames Holden Tire Co., Limited, Montreal, to manufacture automobile tires and accessories and a large plant was erected at Kitchener, formerly Berlin, Ontario. With others he also incorporated the Mount Royal Rubber Co., Montreal, to manufacture tires and other rubber goods. About the same time he was elected president of Ames Holden McCready Limited, manufacturers of rubber footwear and shoes.

Talmon H. Rieder

Mr. Rieder stood high in the business world as a most capable executive and an indefatigable worker. He was held in the warmest regard and highest respect by all who knew him—friends, employes and business associates. He held membership in the Engineers' Club and the University Club of Montreal, the Canadian Rubber Manufacturers' Association and The Rubber Association of America, Inc.

His untiring zeal and constant devotion to his business brought about a sudden and fatal collapse. He will long be revered by his many friends and associates for his sterling qualities as a man and admired for his accomplishments as an enterprising leader and executive.

## Lawrence Bates Jenckes, a Loom Works Director

Lawrence Bates Jenckes, whose death at the age of 55 occurred March 29, 1922, at his home in Worcester, Massachusetts, was a director and member of the development board of Crompton & Knowles Loom Works, manufacturer of tire fabric and other looms, at Worcester, with which organization he had been actively associated for a number of years. He was previously with the Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania, for a considerable period, and was a member of the American Society of Mechanical Engineers as well as of other societies.

## PORTUGAL FAVORS MICHELIN TIRES

Due to a well-planned sales campaign, the French manufacturers of Michelin tires have a firmly-established market for their goods in Portugal. Producers of the English Dunlop tires, it is said, have been unable to meet the terms and prices offered by the French manufacturers.

# News of the American Rubber Trade

## Financial

### Annual Report of The Goodyear Tire & Rubber Co.

THE Goodyear Tire & Rubber Co. statement covering ten months of operation under the new management and showing sales of $82,195,550, reflects the results of further economies put into effect by the present administration.

Net earnings available for interest and fixed charges were $9,640,235. After deducting interest and fixed charges, including miscellaneous adjustments in respect of investment in subsidiary companies, there remained a net balance to surplus of $3,620,043. Cash and United States Treasury Certificates were $23,892,820. Although current liabilities included accrued interest and premium on bonds amounting to $1,371,574, the ratio of current assets to current liabilities was over 10 to one.

A satisfactory present and prospects of a very good future are reported at the plant of the Goodyear Tire & Rubber Co. of California, Los Angeles. The sale of tires for January and February, 1922, was about 39 per cent more than for the same period in 1921. Daily production is now averaging close to 2,900 tires, as compared with 1,080 in the second half of 1920. Although the actual number of units of tires sold in 1921 was much greater than in 1920, last year's total net sales were $14,333,500 as compared with $16,128,850 for 1920. Despite an operating loss of $1,643,568.13 in the fourteen months ended December 31, 1921, the company has made decided headway, as indicated by the reduction of the deficit of March 1, 1921, of $3,157,762 to $1,672,453 at the end of 1921. The Goodyear Textile Mills adjoining the tire plant have been more fortunate. They have been operated at capacity since August 1, last; made a profit of $270,826.29 for the fourteen months ended December 31, 1921; owe nothing to banks; and pay 7 per cent dividends on preferred stock.

Production at the Akron factory is better than 22,000 tires a day, with a low point of 13,500 registered last November. During the second week in April it was announced that 1,000 additional men were being put on in the factory and that production would be increased to 24,000 tires a day if the expected spring business should materialize.

The addition of Francis Seiberling and Russell L. Robinson, both of Akron, to the board of directors as representatives of the common stockholders was well received. This move was made in conformity with the recommendations of the common stockholders' committee and was provided for by the reorganization and recapitalization agreement. The directorate now consists of Roger Hyatt, P. W. Litchfield, Grayson M. P. Murphy, J. R. Nutt, Russell L. Robinson, Robert C. Schaffner, Armin A. Schlessinger, A. H. Scoville, Francis Seiberling, H. H. Springford, George M. Stadelman, G. P. Steele, Ralph Van Vechten and E. G. Wilmer.

Executive officers of the company are: E. G. Wilmer, president; G. M. Stadelman and P. W. Litchfield, vice-presidents; H. H. Springford, assistant to the president; P. H. Hart, treasurer; P. E. H. Leroy, assistant treasurer; C. A. Stillman, secretary; W. D. Shilts and C. F. Stone, assistant secretaries; C. H. Brook, comptroller, and H. D. Hoskin and A. F. Eggleston, assistant comptrollers.

### The American Rubber & Tire Co.

The balance sheet of The American Rubber & Tire Co., Akron, Ohio, as of December 31, 1921, shows total assets and liabilities of $2,005,379. Current assets are $970,740 against current liabilities of $593,261. The surplus is $245,858 and the capital stock, $1,121,600.

## Dividends Declared

| Company | Stock | Rate | Payable | Stock of Record |
|---|---|---|---|---|
| Allis-Chalmers Manufacturing Co., Inc. | Com. | $1.00 q. | May 10 | Apr. 24 |
| Bliss, E. W. Co. | Com. | $0.55 q. | Apr. 1 | Mar. 20 |
| Bliss, E. W. Co. | Pref. | $1.00 q. | Apr. 1 | Mar. 20 |
| Bliss, E. W. Co. B | Pref. | $0.15 q. | Apr. 1 | Mar. 20 |
| Canadian Consolidated Rubber Co., Limited | Pfd. | 1¾% q. | Mar. 31 | Mar. 27 |
| Firestone Tire & Rubber Co. 6% | Deb. | $1.50 q. | May 1 | Apr. 7 |
| Firestone Tire & Rubber Co. 7% | Deb. | $1.75 q. | May 1 | Apr. 7 |
| General Tire & Rubber Co., The | Com. | 2% q. | May 1 | ..... |
| Goodrich, B. F. Co., The | Pfd. | $1.75 q. | July 1 | June 21 |
| Grand Rapids Tire & Rubber Corporation | Pfd. | 2% q. | Apr. 1 | ..... |
| Hodgman Rubber Co. | Pfd. | $2.00 q. | May 1 | Apr. 24 |
| Hood Rubber Co. | Pfd. | 1¾% q. | May 1 | Apr. 20 |
| India Tire & Rubber Co. | Pfd. | 1¾% q. | Apr. 1 | ..... |
| Kelly-Springfield Tire Co. 8% | Pfd. | $2.00 q. | May 15 | May 1 |
| Lee Rubber & Tire Corporation | Com. | $0.50 q. | June 1 | May 15 |
| New Jersey Zinc Co., The | Com. | 2% q. | May 10 | Apr. 29 |
| Standard Underground Cable Co. | Com. | 3% q. | Apr. 10 | Apr. 4 |
| Standard Underground Cable Co. | .... | 3% ex. | Apr. 10 | Apr. 4 |
| United States Rubber Co. 1st | Pfd. | 2% q. | Apr. 29 | Apr. 15 |

## New Incorporations

Adjustable Arc Rims, Inc., March 21 (Delaware)), $2,000,000. R. J. Gorman; A. R. Meyers; R. K. Thistle—all of 65 Cedar street, New York City. Delaware agent, United States Corporation Co., Dover, Delaware. To manufacture and deal in rims, etc.

American Tire Works, Inc., The, February 13 (Rhode Island), $50,000. N. and D. Siegelman, both of 50 Central avenue, Pawtucket; J. T. Burke, 836 Atwells avenue, Providence—both in Rhode Island. To deal in tires, etc.

Annabelle Manufacturing Co., Inc., April 14 (New York), $100,000. N. Vaeth; L. and G. Kallfelz—all of Syracuse, New York. Principal office, Syracuse, New York. To manufacture tires.

Arrow Tire Sales Corporation, March 27 (Delaware), $100,000. T. L. Croteau; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in rubber tires, tubes, etc.

Bedford Tire Co., Inc., March 21 (New York), $5,000. C. S. Lubin, 100 West 118th street, New York; E. Katzka, 385 Vermont street; F. Klein, 1288 St. John's Place, both of Brooklyn—both in New York. To deal in tires.

Bledsoe Blowout Proof Tube Co., February 18 (Washington), $500,000. H. F. Bledsoe, president; V. F. Adair, secretary and treasurer, both of Ellensburg; S. S. Miller, vice-president, Seattle—both in Washington. Principal office, Ellensburg, Washington. To manufacture blowout-proof inner tubes for automobile casings, etc.

Carley Tire Co., T. E., January 27 (New Jersey), $20,000. T. E. Carley, president; H. Carley, assistant secretary and treasurer, both of 189 Prospect Place; E. G. Miller, vice president; J. A. Miller, secretary and treasurer, both of 227 Fairview avenue—both in Rutherford, New Jersey. To buy sell, and deal in tires, etc.

Century Machinery Corporation, April 6 (Delaware), $5,000,000. M. M. Lucey; M. B. Reese; L. S. Dorsey—all of Wilmington, Delaware. Delaware agents, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture articles of rubber, leather, etc.

Chautauqua Products Co., Inc., April 14 (New York), $10,000. W. A. Stoeltzing, 419 Lincoln street; A. W. Jackson, 139 South Main street; F. M. Garfield, 517 Lafayette street—all of Jamestown, New York. Principal office, Jamestown, New York. To manufacture leather and rubber products.

Collins & Co., April 8 (Delaware), $100,000. H. G. Eastburn; W. F. Bouzarth; M. E. Doto—all of Wilmington, Delaware. Delaware agent, G. W. Collins, 110 West Fourth street, Wilmington, Delaware. To manufacture, buy, sell and deal in tires, tubes, etc.

Crescent Rubber Co., March 9 (New Jersey), $25,000. M. M. Glassman; A. Abrahams; J. L. Heher—all of Trenton, New Jersey. Principal office, 150 East State street, Trenton, New Jersey. Agent in charge, J. L. Heher. To manufacture rubber specialties.

Cut Rate Tire Co., The, April 6 (Ohio), $25,000. R. Miller; I. Krugliek; R. H. Everhard; F. B. Melchoir; W. Hirbrook. Principal office, Canton, Ohio. To deal in tires and tubes.

Day & Night Tire & Service Co., The, February 27 (Ohio), $25,000. L. R. McNaull; C. H. Wolfort; G. M. Parks; E. M. Hawkins; C. V. Torgler. Principal office, 1944-1946 Putnam street, Toledo, Ohio. To deal in tires and tubes.

Denman Cord Tire Co., April 17 (Delaware), $100,000. R. H. Johnston, Edgemore; J. A. Morris, Westchester; A. H. Shapiro, Hotel Marseilles, New York—all in New York; F. Fritts, Sound Beach, Connecticut. Delaware agent, Registrar & Transfer Co., 100 West 10th street, Wilmington, Delaware. To deal in tires.

Fidelity Rubber Co., March 21 (Delaware), $250,000. C. E. Allison, 130 Convent avenue; C. R. Allison, 115 Broadway, both of New York City; A. K. Dohrmann, 103 Bleecker street, Jersey City, New Jersey. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To manufacture and deal in all kinds of rubber, etc.

G. & G. Tire Co., February 25 (Texas), $10,000. L. A. Goldstine, president; S. Goldstine, vice-president; F. Goldstine, secretary, treasurer and general manager. Principal office, 700 Commerce street, Dallas, Texas. To deal in tires, tubes and accessories.

G. & W. Merchandise Co., Inc., April 12 (New York), $1,000. J. Waldman, 2060 63rd street; F. M. Wolf, 75 Penn street, both of Brooklyn; S. Goldberg, 605 West 137th street, New York—both in New York. To deal in tires.

General Automatic Manufacturing Corporation, March 18 (Delaware), $1,000,000. C. B. Outten; S. L. Mackey; L. C. Christy—all of Wilmington, Delaware. Delaware agent, Corporation Service Co., Equitable Building, Wilmington, Delaware. To manufacture and deal in tires, etc.

General Tire Co., The, March 24 (Massachusetts), $100,000. E. C. Newcomb, president and treasurer; J. M. Everett, clerk—both of 700 Beacon street, Boston, Massachusetts. Principal office, 506 County street, New Bedford, Massachusetts. To sell tires and tubes.

Glaser Cut Rate Tire Co., April 3 (Ohio), $10,000. J. A. Glaser; K. A. Feist; C. Powell; C. S. Wemtrau; F. Katsopoulos. Principal office, 603 Tuscarawas street, East, Canton, Ohio. To deal in tires and tubes.

Gordon Rubber Co., The, March 2 (Ohio), $10,000. M. E. Taggart; R. E. Erb; T. L. Sheperd; K. Lynch. Principal office, Canton, Ohio. To deal in tires, tubes, and rubber goods.

Hobbs Rubber Corporation, March 28 (New York), $500. G. Norris; W. L. Bryant; H. Bucte—all of 115 Broadway, New York City. To manufacture rubber goods, etc.

Iscolite Corporation, April 8 (New Jersey), $200,000. A. R. Palmer, Madison; W. H. O'Neill, 232 Wester avenue, Jersey City—both in New Jersey; L. Reid, 808 St. Nicholas avenue, New York City. Principal office, 525 Main street, East Orange, New Jersey. Agent in charge, New Jersey Registration & Trust Co. To manufacture and deal in insulating materials and substitutes for hard rubber.

Keystone Tire Co., The, March 18 (Texas), $10,000. M. Arlla, president, 1212 Jackson street; G. W. Krengel, vice-president, 1213 Lamar street; R. W. Plummer, secretary and assistant treasurer, 734 Columbia street—all of Houston, Texas. Principal office, 1113 Main street, Houston, Texas. To buy and sell automobile tires. (Formerly Cut Rate Tire Co.)

Kupperman Bros., Inc., April 11 (New York), $5,000. W. W., H. P. and H. C. Kupperman—all of Syracuse, New York. Principal office, Syracuse, New York. To deal in tires.

Larick Tire & Rubber Co., The, March 24 (Ohio), $100,000. D. L. Lazarick, president; L. A. Lazarick, vice-president; J. R. Nichols, secretary; J. C. Breidenbach, treasurer. Principal office, 1228 Prospect avenue, Cleveland, Ohio. To manufacture tires and reliners.

Leard Tire Co., The G. A. S., March 30 (Ohio), $10,000. G. E. S., G. A. S. and J. A. S. Leard; M. C. Murray. Principal office, 114 East High street, Oxford, Ohio. To deal in tires and tubes.

Lexington Tire Co., The, February 8 (Kentucky), $3,000. B. S. Kenney, president; S. W. Maston, vice-president; H. D. Bridges, secretary and treasurer; J. C. Bridges, manager. Principal office, 342 East Main street, Lexington, Kentucky. To deal in Kelly-Springfield tires.

Lifeguard Swimming Belt Corporation, April 17 (Delaware) $500,000. C. A. Cole, Hackensack; R. A. Van Voorhis, 77 Oak street, Jersey City—both in New Jersey; A. R. Oakley, Pearl River, New York. Delaware agent, Registrar & Transfer Co., 100 West 10th street, Wilmington, Delaware. To manufacture and deal in swimming devices, life preservers, etc.

Lomer Sales Co., January 4 (Indiana), $10,000. R. W. Lyons, president, New Castle; G. G. Rinier, vice-president; P. E. Lundmark, secretary and treasurer, both of Indianapolis—both in Indiana. Principal office, New Castle, Indiana. To distribute tires.

M. & O. Rubber Co., April 4 (Ohio), $20,500. J. A., J. C. and D. Meek; W. C. Owen; M. Mehr. Principal office, Salem, Ohio. To manufacture tires, tubes, etc.

Malcolm Tire Co., Inc., April 7 (New York), $20,000. A. A. Deutsch; H. Margoshes; T. Albert—all of 198 Broadway, New York City. To manufacture tires.

Martin Sales Co., Inc., April 10 (New York), $15,000. W. S. and L. I. Martin, both of 175 Fifth avenue, Upper Troy; D. Martin, Gloversville—both in New York. Principal office, Troy, New York. To manufacture rubber heels, etc.

Miller's Syringe Corporation, Dr., April 6 (New York), $100,000. C. B. Schoenhaus, 853 Southern Boulevard; N. H. Streimer, 99 Nassau street, both of New York; J. Petchosky, 220 Sullivan street, Brooklyn—both in New York. To manufacture syringes and druggists' sundries.

National Chain Tire Shops, March 13 (Georgia), $10,000. O. H. and G. L. Smith; B. Egerton. Principal office, Atlanta, Georgia. To manufacture and buy tires and tubes.

One Dollar Profit Tire Co., The, March 25 (Ohio), $10,000. H. D., M. J. and N. T. Cook; P. R. Miller. Principal office, Ashtabula, Ohio. To deal in tires and tubes.

Para Belle Tire & Rubber Co., The, March 11 (Ohio), $25,000. C. A. Henne; W. Parker; M. A. McManus; J. R. Kistner; J. P. Harkin. Principal office, Cleveland, Ohio. To manufacture tires and tubes.

Patric Co., Inc., The, March 31 (Delaware), $100,000. F. L. and M. E. Mettler; P. M. Gilkey—all of Wilmington, Delaware. Delaware agent, F. L. Mettler, 832 Market street, Wilmington, Delaware. To manufacture raincoats.

Perfection Tire Shop, Inc., February 24 (Illinois), $2,500. P. R. Simon, 521 East 49th street; V. E. Krajci, 2946 West 25th Place; M. R. Hartigan, 523 Englewood avenue—all of Chicago, Illinois. Principal office, Chicago, Illinois. To buy and sell tires and tubes.

Puncture Proof Tire & Accessories Co., The, March 25 (Delaware), $300,000. S. J. Mardis; H. A. Weekes, both of Johnstown; J. I. Hughes, New Florence—both in Pennsylvania. Delaware agent, Colonial Charter Co., 927 Market Street, Wilmington, Delaware. To manufacture and deal in rubber, etc.

Queen Shield & Rubber Co., Inc., April 10 (New York), $25,000. A. Famely, 458 West Broadway; I. Hausen, 558 West 181st street; A. B. Albert, 305 Broadway—all of New York City. Principal office, 458 Broadway; New York City. To manufacture rubberized merchandise, etc.

Registire Co., Inc., The, April 8 (Delaware), $1,000,000. T. L. Croteau; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture tubes, valves, etc.

Reilly Rubber Co., January 16 (California), $50,000. J. R. Reilly, president and treasurer; J. Reilly, secretary. Principal office, 2432 East 56th street, Los Angeles, California. To manufacture inner tubes for automobile tires.

Rex Tire & Rubber Co., March 3 (Illinois), $10,000. A. I. and R. Epstein, both of 3509 Douglas Boulevard; S. S. Byron, 1305 South Michigan avenue—both of Chicago, Illinois. Principal office, 1305 South Michigan avenue, Chicago, Illinois. To buy, sell and manufacture tires, tubes, etc.

Rubber Cushion Horseshoe Co., The, February 23 (Pennsylvania), $100,000. J. M. Beavan, president and general manager; G. F. Turner, secretary and treasurer—both of New Castle, Pennsylvania. Principal office, New Castle, Pennsylvania. To manufacture horseshoes equipped with removable toes and heels made of rubber.

Rubber Manufacturing Corporation, The, April 12 (Delaware), $500,000. T. L. Croteau; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in tires, tubes, etc.

Rubber Products Industries, Inc., The, April 10 (New Jersey), $2,000,000. E. J. Spitzer, Derby, Connecticut; G. F. Long, Kearney; I. W. Teeple, Newark—both in New Jersey. Principal office, 207 Market street, Newark, New Jersey. Agent in charge, I. W. Teeple. To manufacture rubber products.

Schram Bros. Tire Co., January 12 (Michigan), $40,000. W. A. Schram, president, 4100 Clippert avenue; E. E. Schram, secretary and treasurer, 3433 McClelland avenue—both of Detroit, Michigan. Principal office, 3923 Michigan avenue, Detroit, Michigan. To buy, sell and deal in tires, tubes, etc.

Shein Tire Corporation, March 14 (Illinois), $5,000. B. Shein, president, 4936 Bernice avenue; S. Goodman, vice-president, 1519 South Kedzie avenue; H. J. Bloom, secretary and treasurer, 1238 South Spaulding avenue—all of Chicago, Illinois. Principal office, 712 South Wabash avenue, Chicago, Illinois. To deal in tires, etc.

Stratford Specialty Co., February 16 (Connecticut), $15,000. A. D. Allard, president and treasurer; P. E. Baldwin, vice president; H. J. Baldwin, secretary. Principal office, 2381 Main street, Stratford, Connecticut. To deal in tires and tubes.

Tire & Replacement Co., The, April 5 (Ohio), $100,000. J. A. Shaffer; R. L. Neff; J. E. Maloney; R. L. Hinds; C. J. Krouse. Principal office, Cincinnati, Ohio. To manufacture and deal in tires and tubes.

Tire & Replacement Co. of North America, February 16 (Illinois), $20,000. J. T. Cantor, 649 East 50th Place; B. Friedman, 2433 Luella avenue; S. Simon, 2244 West Walton street—all of Chicago, Illinois. To deal in tires.

Toledo Mutual Supply Co., The, March 18 (Delaware), authorized capital 1,100 shares without nominal or par value. C. M. Fyler, 714 Oakwood avenue; M. C. Paquette, 603 West Central avenue; G. R. Huntley, 1327 Parkside Boulevard—all of Toledo, Ohio. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To deal in tires, etc.

United Cycle Co., Inc., January 27 (Connecticut), $15,000. R. and J. B. Berardi, both of 186 West Liberty street; A. Massaro, 402 South avenue—both of Bridgeport, Connecticut. Principal office, 570 State street, Bridgeport, Connecticut. To deal in tires, etc.

Utility Rubber Co., The, March 18 (Delaware), authorized capital, 10,000 shares without nominal or par value. J. D. Cass; J. H. Coghill, both of Morristown; F. H. Smith, 175 Berkeley avenue, Bloomfield—both in New Jersey; A. H. Marks, 677 Fifth avenue; G. E. Norwood, 280 Madison avenue; G. L. Green, 300 Madison avenue; C. D. M. Cole, 195 Broadway—all of New York City. Delaware agent, United States Corporation Co., Dover, Delaware. To manufacture and deal in tires, tubes, etc.

Vic Rubber Co., Inc., April 4 (New York), $20,000. S. Kaplan, 1099 Dumont avenue; S. Gromet, 1423 Lincoln Place; M. Gromet, 1512 Lincoln Place—all of Brooklyn, New York. Principal office, 110 Gerry street, Brooklyn, New York. To deal in tires, etc.

Westfield Tire & Rubber Co., Inc., March 16 (Massachusetts), $15,000. E. G. Martel, president, 15 Morris street; W. J. Poirier, treasurer and clerk, 27 Mill street—both of Westfield, Massachusetts. Principal office, Springfield, Massachusetts. To manufacture and deal in tires, etc.

## The Rubber Trade in the East and South

### Manufactured Goods

The predicted improvement in rubber goods manufacturing has materialized with the coming of spring. Mechanical rubber goods companies are doing an active business, in some instances making record shipments. A marked factor in the mechanical rubber goods trade is found in the purchase of railway equipment which has begun in earnest preparatory to the general revival of business. The widely-extended coal strike is unquestionably the chief menace to the return of industrial prosperity. The tire manufacturing season is showing up strong in all sections. Production is largely of the cord rather than the fabric type, and of excellent quality.

There are fully 50 plants in which heels and soles are the chief output or an important part of it. These have been busy all winter and continue to be so. Rubber heels having become standard shoe equipment, steady production in large volume is assured all the year around.

Revival of building operations has renewed activity in the wire-insulating companies, all of whom are reported on increased production.

Sundries, novelties, and balls are in fairly good demand.

Foreign-made toys are in somewhat sharp competition with those of domestic production.

Weatherproofed clothing manufacture has not yet shown the relative improvement noted in most other lines.

### New York

Newly-elected officers of the Gutta Percha & Rubber Manufacturing Co., 126-128 Duane street, New York, N. Y., include the following: Henry Spadone, president; Amedee Spadone, vice-president; F. E. Miller, vice-president; Alfred A. Spadone, secretary, and George B. Dickerson, treasurer and assistant secretary. Walter W. Spadone, who for fifteen years has held the office of vice-president, has retired in order to assume the presidency of the allied corporation, the Spadone Machine Co., Inc., manufacturer of the Bolton bias cutter. Although taking charge of this steadily-growing organization Mr. Spadone retains, however, his interest in the Gutta Percha & Rubber company, remaining on its

board of directors. Amedee Spadone and F. E. Miller have been associated with the company for several years. As in the past, the organization as a whole will endeavor to maintain its reputation for excellence of products.

On April 1 the central offices of the Kelly-Springfield Tire Co. were removed from 200 West 57th street, and all departments were consolidated at the new address, the Fisk Building, 250 West 57th street, New York, N. Y. The company's service station will, however, continue to be maintained at 553 West 57th street, and with this the New York branch will be consolidated.

The recent removal of offices from the 42nd Street Building to the Fisk Building, 250 West 57th street, New York, N. Y., has been announced by Brander & Curry, Inc., dealer in Sea Island, Egyptian, and peeler tire fabrics, cord yarns and fabrics, chafing strips, etc.

J. H. Lane & Co., cotton fabric sales agent, with general offices at 334 Fourth avenue, New York, N. Y., announces that on July 1, 1922, it will discontinue selling the products of the Callaway group of mills.

William H. Cummings & Sons, formerly at 60-62 Harrison street, removed on May 1 to more commodious offices in the Hudson Terminal Building, 30 Church street, New York, N. Y. This firm, established in 1873, is engaged in buying and selling scrap rubber.

A. W. Stedman, crude rubber broker, removes his offices on May 1 from 68 Broad street to larger quarters at 90 West street, New York, N. Y.

Charles T. Wilson Co., Inc., announces the removal of its offices from 56 Wall street to Munson Beaver Building, 82 Beaver street, New York, N. Y. The firm specializes in the importation of crude rubber and foreign produce.

R. S. Hardy Co., a firm of crude rubber brokers previously at 25 Beaver street, will be located, after May 1, at 66 Broad street, New York, N. Y. Members of the firm include Roger S. Hardy, F. H. Lyon, and C. J. Lockhorn.

H. A. Astlett & Co., the well-known importer specializing in crude, washed and refined rubber, announces the removal of its offices from 113 Pearl street to 64 Water street, New York, N. Y.

Paul Bertuch, importer and exporter of rubber, and formerly located at 25 Beaver street, announces the removal of his offices to 24 Stone street, New York, N. Y.

The Binney & Smith Co., which have been, for more than twenty years, occupying offices at 81-83 Fulton street, after June 1 will be located on the nineteenth floor of the Liggett Building, corner of Madison avenue and 42nd street, New York, N. Y. The business of this organization has, during the period mentioned, steadily increased, until it now includes the manufacture as well as the importation and exportation of colors, clays, chemicals, and talc. The production of black pigment of every type and grade represents the chief specialty of the company.

After May 15 the new address of the National Aniline & Chemical Co., Inc., formerly 21 Burling Slip, will be 40 Rector street, New York, N. Y. At the new location the company will have better facilities for handling its increasing business.

The Thermoid Rubber Co., Trenton, New Jersey, has discontinued its warehouse in New York, but still maintains an office at 201-203 West 49th street, from which orders telephoned the Trenton factory before noon are delivered in New York the following morning by motor truck, thus giving customers improved service.

The Corrugated Rubber Corporation, recently organized with main offices at 25 West 43rd street, New York, N. Y., and a capitalization of $1,500,000, has prepared plans for a factory at Poughkeepsie, New York. This plant, 200 by 80 feet, will have a production capacity of 200,000 inner tubes a year, and will specialize in the "Corrugated" type covered by the Fairchild patented process. Sales will be handled by the Edward A. Cassidy Co., Inc., as the exclusive representative throughout the United States. The officers of the Corrugated Rubber Corporation include: G. B. Gosman, president; W. L. Fairchild, vice-president; Avery McDougall, secretary and treasurer; F. W. Gaver, chemist and superintendent of production; B. F. Taylor, general manager.

The establishment, by the India Tire & Rubber Co., Akron, Ohio, of a branch warehouse at 250 West 54th street, New York, N. Y., represents the sixth depot which this company has organized in less than a year. Other warehouses are located at Dallas, San Francisco, Milwaukee, Minneapolis and Cleveland.

Larger quarters becoming necessary, the Pennsylvania Rubber Company of America, Inc., with general offices at Jeannette, Pennsylvania, will move its New York offices, about May 1, from 1889 Broadway to 2006-2008 Broadway. At the new address more than three times the floor space of the old quarters will be available, and accordingly the company's export division will also be moved from the present offices in the Woolworth Building to the new location. This division, however, will be maintained as a separate organization. C. G. McCullough is in charge of the New York offices.

A removal of the Eastern district offices of the Hewitt Rubber Co., Buffalo, New York, from 238 West 55th street to 9 West 61st street, New York, N. Y., has been recently announced. It is believed that the new and more central location offers greater possibilities, particularly in the matter of advertising Hewitt cord and fabric tires. J. R. Benedict is eastern sales manager.

### Buffalo

The Buffalo direct factory branch of The Miller Rubber Co., Akron, Ohio, including store and warehouse, has been permanently located at 14 West Utica street, Buffalo, New York, in charge of R. N. Harwick, branch manager. Eleven counties in western New York and Pennsylvania constitute the territory assigned to this branch.

E. G. Rippel, who has been an important factor in the development of the Buffalo Foundry and Machine Co., Buffalo, New York, and has recently held the position of sales manager, has retired from the organization after a service of 21 years. His successor, C. W. Pearson, who is also assistant treasurer, has been connected with the firm for 17 years. The Buffalo Foundry and Machine Company specializes in vacuum dryer construction, manufacturing "Buflovak" evaporators, and also apparatus for sugar refineries and chemical establishments. H. D. Miles is president of the organization.

The Madison Tire & Rubber Co., with factories and general offices at Buffalo, New York, reports that it has been considered advisable to discontinue the manufacture by its organization of all fabric tires with the exception of the 30 by 3 and the 30 by 3½ sizes. It is also stated that the manufacture of red tubes will be discontinued. H. Tyler Kay is the company's advertising manager.

### Connecticut

The Santalucia Rubber Heel Co., Inc., recently organized with offices at 825 West Main street, Waterbury, Connecticut, is capitalized at $5,000, and succeeds the Santalucia Brothers Co. The officers and directors are: Julius, Samuel, and Salvatore Santalucia, and Charles W. and Frederick W. Palomba.

Francis A. Stockwell recently joined the sales organization of the Hewitt Rubber Co., Buffalo, New York, and will cover the Connecticut district, operating out of Hartford. Mr. Stockwell is under the supervision of J. R. Benedict, the Eastern district manager for the Hewitt company.

### Pennsylvania

With orders in some departments for more than a year's work, the Vulcanized Rubber Co., of Morrisville, Pennsylvania, is experiencing a wave of prosperity. More than 400 employes are now at work and the mill is as busy as during the war period. The company manufactures hard rubber articles, such as pipe stems, combs, electrical supplies and parts of radio outfits. The latter industry is responsible for a greater part of the present boom. The company manufactures several million pipe stems each month.

At the annual meeting of The Rubber Association of Philadelphia, Philadelphia, Pennsylvania, the following officers were elected: C. D. Garretson, president; F. L. Bacon, vice-president; Jacob R. Baltz, treasurer, and D. P. Morgan, secretary, 1021 Filbert street, Philadelphia, Pennsylvania. Members of the executive committee include: F. L. Bacon, Gustin-Bacon Mfg. Co.; Jacob R. Baltz, General Tire Co. of Philadelphia, Inc.; A. Boyd Cornell, Hamilton Rubber Manufacturing Co.; Joseph Emerson, New York Belting & Packing Co.; C. D. Garretson, Electric Hose & Rubber Co.; John Kearns, Lee Tire & Rubber Co., and William F. Metzger, Quaker City Rubber Co.

The National Foreign Trade Council extends to foreign business men, and to Americans doing business in foreign countries, a cordial invitation to attend the ninth National Foreign Trade Convention, to be held in Philadelphia, Pennsylvania, May 10-12. United Kingdom business men who care to attend the convention should notify the secretary of the National Foreign Trade Council, Hanover Square, New York, N. Y., as early as possible.

### Eastern and Southern Notes

R. T. Vanderbilt Co., Inc., New York, N. Y., expects to put in operation a new mill at Rutland, Vermont, for the production of its Plymouth brand of whiting. This material is mined from a deposit of soft calcium carbonate of extremely low alkalinity, and which it is claimed is equivalent to chalk whiting as a compounding ingredient.

The Ajax Rubber Co., Inc., with executive offices at 218-222 West 57th street, New York, N. Y., reports the recent appointment of Lake Jones as district manager of the company's southeastern territory, with headquarters at Atlanta, Georgia. Mr. Jones has had much experience in the rubber industry, being especially familiar with sales and general development methods.

The Rubber Production Corporation, Morgantown, West Virginia, has recently leased the plant owned by the Armorcord Rubber Co., of the same city, and will manufacture both cord and fabric casings. P. C. Hudson is the superintendent of the former company

## The Rubber Trade in New Jersey

### Manufactured Goods

Trenton rubber manufacturers, almost as a body, report continued improvement in business conditions. A canvass of every plant in the city indicates increased production in almost every line. With seasonable weather such lines as garden hose, jar rings and tires should continue to show increased production and sales. Increased earnings shown by a number of railroads have stimulated demand for railroad mechanical rubber goods and rubber manufacturers, who have had to wait months for settlements, now report many railroads are settling promptly and many discounting invoices. With the expected improvement in foreign exchange, following the successful outcome of the Genoa Conference, local manufacturers, who have had export trade in the past, are looking forward to a revival of this business. Export business has been practically suspended on account of unfavorable rates of exchange. Old-time accounts have been suspended because of the inability of the European client to pay for American-made goods in American money, and resell them at the deflated European monetary values.

### Trenton Notes

The Ajax Rubber Co., Trenton, continues to operate at full capacity and W. W. McMahan, general manager and vice-president of the company, is optimistic regarding the outlook for business.

The Rubber Manufacturers' Association of New Jersey held its regular meeting on the evening of April 10, at the Trenton Country Club. A dinner was served for twenty and the evening spent most enjoyably. The recent death of John J. Voorhees, president of the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey, was referred to and a resolution extending the sincere sympathy of the association was passed.

The Thermoid Rubber Co., Trenton, figured largely in the recently-made world's automobile trial records at Daytona Beach, Florida, on April 5, through the medium of the Thermoid Universal Joint. The successful driver, Sig Haugdahl, ascribes his success largely to the use of this joint.

Horace B. Tobin, president of the Woven Steel Hose & Rubber Co., Trenton, was recently elected president of Mercer Hospital. Mr. Tobin's great interest in humanitarian movements fits him particularly well for this office.

The Vulcan Rubber Co., whose plant was gutted by fire, is getting the factory into shape again for the preparation of material for the Essex Rubber Co. All the company's products are used by the Essex concern.

### New Jersey Notes

Harry Klag, Jr., trustee of the Zee Zee Rubber Co., Yardville, bankrupt, received an offer of $60,000 for the real estate, factory buildings, equipment and personal property. The equipment includes a cracker sheeter, three mills, calender and press vulcanizer. The offer was rejected and the sale postponed until May 17, when the entire property will be offered to the highest bidder.

The Rubber Products Industries Co., Inc., Newark, New Jersey, has been incorporated with $2,000,000 capital for the purpose of manufacturing, buying and selling and dealing in rubber or any kind of articles or specialties made with or from rubber or in the making of which rubber is an element. The company is also empowered to manufacture, buy and sell, import or export goods. The company will probably lease ground and erect a rubber plant. The office is at 207 Market street, Newark, with Irving W. Teeple as agent. The incorporators are Ernest J. Spitzer, Derby, Connecticut; George Franklin Long, Kearny, New Jersey; and Irving W. Teeple, Newark, New Jersey, who hold 50 shares each. The company will issue 200,000 shares of preferred stock, representing $500,000, and 150 shares of common stock representing $1,500,000.

The entire issue of the common stock of the Irvington Varnish & Insulator Co., Irvington, New Jersey, has recently changed hands, having been acquired by a syndicate composed of William F. Hoffman, Arthur E. Jones, and Carl Egner, who will hold the positions of chairman of the board of directors and a vice-president, president, and secretary, respectively, as well as being also directors of the company. Andrew Young, a vice-president and general manager, and D. F. Burnett, treasurer, are also directors of the organization, and were members of the old board. Four of these executives are connected with other organizations.

The Braender Rubber & Tire Co., Rutherford, New Jersey, announces the following changes in its executive staff: J. K. Watson, president; F. L. Braender, W. P. Braender, H. Braender, and M. E. Morris, vice-presidents; J. K. Watson, treasurer; Milton Dammann, secretary; and F. J. Sullivan, comptroller.

The Resilient Tire Co., of Camden, New Jersey, has been incorporated with $250,000 capital to engage in the automobile tire business. The incorporators are Bruno G. Erler, Oak Lane, Pennsylvania; Taylor J. Davidson, Camden, New Jersey, and Julius Richter, New York, N. Y.

## The Rubber Trade in Rhode Island

For the first time in many months there is an optimistic spirit dominant in the rubber manufacturing industry of Rhode Island and the belief seems general that a decided improvement in business is at hand. Reports from all quarters, and especially from those associated directly or indirectly with the United States Rubber Co., which controls practically a majority of the rubber-working plants in this state, are of a decidedly encouraging tenor. Present indications are that with the advancement of the month of May, the various divisions of the big rubber corporation will begin to operate on something approaching normal schedules and that better times are in prospect for those interested in the industry.

The reports published in connection with the recent annual meeting of the United States Rubber Co. were read here with more than usual interest. The statement that the corporation's business generally had shown a steady improvement since the close of last year and that the present healthy conditions give good promise of a real revival during the second half of this year, has been received with much satisfaction.

In Woonsocket and Millville where the Alice and the Millville mills, respectively, are located, special interest has been manifested in the announcement that the footwear division of the United States Rubber Co. will be in active operation soon, so that, with the beginning of the second half of the year a return to normal earning power may be confidently expected.

The tire situation in this state has been watched with considerable interest because of the extensive textile strike that has closed practically all the cotton-producing plants in both the Pawtucket and Blackstone valleys ever since the early part of January and which gives no signs of immediate termination. In the meanwhile, the advancing season has created demands for tires that have been accelerating business to such an extent that it is beginning to force a stringency in the accumulated stocks and creating a most decided possibility of a shortage of some sizes, at least, at an early date. Upon the whole, the outlook with the advent of May is the brightest and most hopeful that it has been in nearly two years.

At the annual meeting of the stockholders of the Woonsocket Rubber Co. held in Providence, on March 27, the following officers were reelected: Walter S. Ballou, president; George Schlosser, of Woonsocket, vice-president and general factory manager; Clarence H. Guild, secretary and treasurer; board of directors—the above-named officers and James Harris, of Providence, and Homer E. Sawyer and C. B. Seger, of New York.

George Schlosser was elected president of the National India Rubber Co., of Bristol, on March 27, at the annual meeting of the stockholders and directors held in Providence. Mr. Schlosser, who was also reelected general factory manager, had been vice-president of the corporation. He succeeds the late Colonel Samuel P. Colt as president. Homer E. Sawyer, of New York, who is vice-president in charge of the footwear division of the United States Rubber Co., was chosen vice-president of the National India Rubber Co., in Mr. Schlosser's stead.

Other officers elected included the following: Maurice C. Smith, Jr., secretary and treasurer; John D. Carberry, assistant secretary; Lester K. Monroe, assistant treasurer; board of directors—George Schlosser, Walter S. Ballou, Homer E. Sawyer, Charles A. Emerson, James Harris, George H. Mayo, E. J. Coughlin and C. B. Seger.

Mr. Schlosser first came to Bristol as superintendent of the National India Rubber Co. in 1895. At that time there were about 2200 persons employed at the factory engaged in the manufacture of every known product of rubber. He left Bristol in 1900 to become superintendent of the Woonsocket Rubber Co. Returning in 1916, after the death of LeBaron B. Colt, Jr., he became vice-president and general factory manager which position he has held since that time.

In accordance with the plans of the United States Rubber Co. throughout the country, the National India Rubber Co. has specialized in the manufacture of Keds and insulated wire since 1913. The maximum production of Keds was reached in 1919 when 4,700 persons were engaged in the manufacture of 55,000 pairs daily. Despite the industrial conditions at the present time, there are about 4,000 hands employed at this plant with an output of approximately 40,000 pairs of Keds daily.

Mr. Schlosser will continue as general factory manager at the National Co., in addition to his duties as president. He is also general factory manager of the Alice Mill at Woonsocket, of the Millville Mill of the Woonsocket Rubber Co. at Millville, and of the Lawrence Felting Co., also of Millville.

Two equity suits requesting instruction in the administration of the estate of the late Colonel Samuel P. Colt have been filed in the Superior Court for Providence County by the Industrial Trust Co. as executor under the trust created by Colonel Colt in 1908.

The Town of Richmond has made an appropriation for the purchase of 1,000 feet of hose for its fire truck. Cranston has $2,500 included in its new budget for the purchase of fire hose.

The partnership existing between Frank R. Larson and Philias J. Savoie as rubber cement manufacturers under the firm name of Savoie Rubber Manufacturing Co., in Woonsocket, was dissolved March 24 by mutual consent, Mr. Larson withdrawing. The business will be continued under the same name by Mr. Savoie together with Isala Savoie, all assets and liabilities being assumed by the new concern.

In the case of the Marathon Tire & Rubber Co. against the Invincible Tire Co., heard before Judge Blodgett in the Superior Court for Providence County, the court directed a verdict for the plaintiff for $570.80.

## Specialist in Industrial Engineering

Arthur T. Hopkins, well-known in executive and manufacturing circles of the American rubber trade, was assistant superintendent and superintendent of the Boston Woven Hose & Rubber Co. from 1900 to 1912, during which time he reorganized the entire factory and built the new plant.

Arthur T. Hopkins

In 1912 he was called to the Cleveland mechanical goods plant of the United States Rubber Co., and during the following five years reorganized and rebuilt that plant. In 1917 he was transferred to the Footwear Division of the United States Rubber Co. as industrial engineer, and devoted five years to reorganization and management work among the footwear and other factories of that system.

Mr. Hopkins has now become a member and treasurer of the engineering firm of H. M. Haven & Wm. W. Crosby, Inc., Boston, Massachusetts. This corporation is well known in the industrial field. Its specialty has been refrigeration, confectionery and other manufactures calling for controlled atmosphere. It will now maintain, under the personal direction of Mr. Hopkins, a department of industrial engineering and management, in response to a consistent demand from financial and industrial interests for the application of analytic and constructive methods in the solution of industrial problems from the managerial and engineering viewpoint. These problems are of vital importance and their range includes purchasing, production, manufacturing economies, personnel, merchandising, and finance.

## Eben Franklin Dewing, Secretary

Eber Franklin Dewing, secretary and a director of the Boston Rubber Shoe Co., and other Massachusetts corporations affiliated with the United States Rubber Co., was born in Revere, Massachusetts, August 27, 1874. He was educated in the public and high schools of Revere and Chelsea, and Burdett Business College, Boston, Massachusetts, from which he graduated in 1892.

Eben F. Dewing

The following year he entered the employ of Edmands & Mayo, Boston, Massachusetts, as a clerk, and in 1894 went to the Boston Rubber Shoe Co., in the same city, as office assistant, becoming assistant cashier in 1898, and clerk of the corporation and a director in 1918. In 1910 he was elected clerk and assistant treasurer of the American Rubber Co., Cambridge, Massachusetts, and became a director in 1913. In 1915 he was elected clerk and a director of the Stoughton Rubber Co., Stoughton, Massachusetts; in 1918, secretary of the Rubber Mutual Liability Insurance Co., and in 1920 a director. Since 1908 he has been secretary to Lester Leland, vice-chairman of the United States Rubber Co.

Mr. Dewing enjoys a wide acquaintance in the rubber trade and through the various Masonic bodies with which he is identified. He is also a member of The Rubber Association of America; the Sons of the American Revolution; Exchange Club, Boston, Massachusetts; the Winchester Country Club, Winchester, Massachusetts, and chairman of the Board of Registrars of the town of Arlington, Massachusetts.

## The Rubber Trade in Massachusetts

### Manufactured Goods

April has been a busier month than March for practically every rubber goods manufacturer in Massachusetts. Tire production is at or very near capacity, and the same may be said of rubber soled canvas footwear. Factories are booked well ahead on galoshes for next season and there is a brisk inquiry for women's artics. Dealers who place orders early will have a choice of styles and avoid disappointments in deliveries.

Rubber heel and sole production continues to increase, not only for the repair trade but for shoe manufacturers. The vogue of sport shoes is teaching the public the merits and comfort of rubber heels and the demand for leather shoes with rubber heels increased correspondingly. Rubber soled shoes and spring heels are now selling best and sole leather tanners are beginning to feel the competition.

Mechanical rubber goods sales have been better than was anticipated, reflecting steadily if slowly improving general business. Hose and jar ring lines are seasonally active. Druggists' sundries orders continue in good volume, and the tremendous popular demand for radio equipment has stimulated the demand for various hard rubber articles. Proofing and clothing lines are rather quiet, but the call for automobile topping increases with the growing demand for cars, following the widespread reductions of the early spring.

### Boston Notes

The third National Shoe and Leather Exposition and Style Show in Boston will be held in Mechanics' Building, July 10 to 13, inclusive, and is expected to excel former shows in comprehensiveness and interest. Rubber-soled canvas sports footwear will be an important feature as in former years. Exhibits are in charge of a committee of which Major Charles T. Cahill, of the United Shoe Machinery Corporation, is chairman. E. L. Phipps and W. L. Wardell, both of the United States Rubber Co., Boston, are members of the committee.

The Lee Tire & Rubber Company, under the able administration of Guy D. Niles, recently appointed New England district manager, has outgrown its former quarters at 1100 Boylston street, Boston, and now occupies a new building at 851 to 857 Boylston street, where it has commodious offices and an ample stock of tires.

The Howe Rubber Corporation is soon to open a factory branch in Boston that will complete a long line of such branches extending from coast to coast. V. J. Mulherin, who has been the distributer of Howe tires and tubes in New England for the last nine years, will be in charge, having been appointed northeastern district manager.

John J. Batterman, 139 Lincoln street, Boston, former sole selling agent for the rubber heels manufactured by the Plymouth Rubber Co., Canton, Massachusetts, is now handling the rubber heel sales of the Bloomingdale Rubber Co., of Butler, New Jersey.

The Wetmore-Savage Co., 180 Massachusetts avenue, Boston is exclusive New England distributer for Badger tires and tubes, manufactured by the Badger Rubber Works, Milwaukee, Wisconsin.

The Grow Tire Co., 323 Columbus avenue, Boston, has completed a factory addition at its plant in Canton Junction, Massachusetts, and production will be increased from 600 to 1,000 tires a day on April 1.

E. H. McCoy is now manager of the New England branch of the Kelly-Springfield Tire Co. at 698 Beacon street, Boston.

The Perfection Rubber Co. has opened branch headquarters for Perfection tires and tubes at 885 Boylston street, Boston. T. Robert Sullivan and N. V. Reardon are the officers of the company.

### Miscellaneous Massachusetts Notes

The officers of the newly reorganized Plymouth Rubber Co. Inc., Canton, Massachusetts, are: A. Bieringer, president; I. Hamilburg, vice-president, and Jacob Swartz, treasurer. The company is concentrating on its sales of Plymouth, Slipknot and Norfolk rubber heels under the direction of Frank Weber, sales manager; H. Hubbard, assistant sales manager, and B. I. Racow, sales director for the Western States. William E. Thayer, formerly with N. F. Thayer & Co., manufacturers of cut soles, is New England district road manager. He is well known in the trade as president of the Greater Boston Association of Finders.

The Hood Rubber Co., Watertown, Massachusetts, is operating its tire and canvas footwear departments at capacity, and its rubber footwear department at about 70 per cent of capacity. Tire sales for the year are expected to exceed those of last year by $1,000,000.

The plants, equipment and materials of the O'Bannon Corporation, manufacturer of coated fabrics, at Taunton, Massachusetts, and West Barrington, Rhode Island, which has been operating under a receivership for several months, have been purchased by the creditors and the business has been reorganized under the name of the O'Bannon Co., with headquarters at the West Barrington plant. The officers of the new company are George H. Clough, president; Andrew F. Carter, vice-president and treasurer; H. O. Wellman, secretary. The personnel of the operating departments will remain practically the same, but the firm's affairs will be under the management of the Russell Co., of Boston, Massachusetts.

The General Tire Co. has been incorporated with a capital of $100,000 to deal in automobile accessories. The incorporators are Edgar C. Newcomb and Joseph M. Everett, of Brookline, and Albert L. Banks, of Somerville. The new company is located at 506 County street, New Bedford, Massachusetts.

Edward Offutt, former assistant factory manager of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, has been advanced to the position of comptroller of the company.

The Panco Rubber Co., Chelsea, Massachusetts, has more than doubled its sales each year since its incorporation in 1918. The company's chief products are Panco taps, although full soles and heels, and various mechanical and rubber-coated goods are also manufactured. The executives of the Panco company are as follows: Frank Bernstein, president; William Bernstein, treasurer; Miah Marcus, vice-president and secretary, and Dudley Freeman, sales and advertising manager.

## Quarter-Century of Hood Rubber Co.

A quarter-century of steady growth since its incorporation in 1896 finds the Hood Rubber Co., Watertown, Massachusetts, operating the largest single plant for the manufacture of rubber footwear in the world, its daily capacity being over 75,000 pairs. Although rubber footwear constitutes about 75 per cent of the gross sales, the plant has a daily capacity of 2,000 pneumatic tires and tubes, and also manufactures solid tires, hard rubber and molded goods. About 7,500 persons are now employed.

The Hood plant is situated on a tract of about 33 acres of land, well-located about five miles from the business center of Boston on the Boston & Maine Railroad, and adjacent to it the firm also controls an additional 60 acres available for future expansion. The plant contains 1,458,767 square feet of floor area, and the buildings and equipment are modern, well-designed, and maintained to keep pace with the company's steadily-increasing business.

The company's products are distributed through a subsidiary corporation, the Hood Rubber Products Co., Inc., which has a large sales organization with 24 branches in leading cities of the United States. The entire common stock of this corporation is owned by the Hood Rubber Co., to which all surplus profits accrue.

Sales for the calendar year 1921 were about $25,000,000, notwithstanding reduction of prices. This equals the year 1919 and compares favorably with 1916, when sales totaled $11,666,501. The company's record year was 1920, with sales amounting to $32,884,131.

## A Pioneer Rubber Machinery Manufacturer

J. K. Williams, who was recently elected first vice-president of The Franz Foundry & Machine Co., Akron, Ohio, has been long and widely known as an inventor and manufacturer of rubber machinery. He was the founder and former president of The Williams Foundry & Machine Co., and in the early years of his business career manufactured bicycles. When the rubber tire business came into being he made the first mold and core equipment for the oldest Akron tire manufacturers, including Dr. B. F. Goodrich, founder of The B. F. Goodrich Co.

J. K. Williams

In selling out his interests in The Williams Foundry & Machine Co. in 1918 and joining The Franz Foundry & Machine Co., Mr. Williams again associated himself with M. C. Franz, now president of the Franz company and formerly secretary of the Williams company from the time of its organization until the sale of the plant in 1918.

Machinery and equipment demand has become such that the Franz plant is now working on a 24-hour-day basis and the company is considering expansion plans. Mr. Williams' connection with the company obviously lends great prestige to it.

## The Rubber Trade in Ohio

### Manufactured Goods

The rubber tire industry in Akron is operating practically on a normal basis as far as dealers' business is concerned, with every indication that as soon as automobile manufacturers take a normal supply of tires for original equipment the industry will have proceeded to "boom" proportions. Those factories which depend upon dealers' business to the exclusion of original equipment business are now operating at normal capacity.

In other lines marked improvement has been noted during the past month. Mechanical goods sales to date have far exceeded anything expected even by the most optimistic at the beginning of the year, due to improvement in every line of industry.

Footwear sales during the latter part of the season will make up to some extent for the earlier decreases. Dealers and job-

Plant of the Hood Rubber Co., Watertown, Massachusetts

bers held off buying until stocks had been moved off their shelves.

In druggists' sundries lines improvement is shown despite the fact that this is a period between selling seasons. Jobbers' stocks, however, have been brought down to a point where they must buy for immediate requirements, which has resulted in a constant stream of orders.

While automobile tire prices do not yet give promise of the increase so sorely needed to make possible a good showing by rubber companies, it is believed that an increase may be expected in mechanical goods. Shoe and druggists' sundries prices have been stabilized.

Reclaimed rubber, while showing slight improvement, cannot be said to be finding a very good market except in those lines where reclaim is an essential part of the manufactured product regardless of market conditions. Hard rubber is in better demand due to increased activity, especially in automobile factories.

Throughout the industry a confidence is apparent regarding the future which has not been duplicated for many months.

## General Rubber Merchandising Methods

Quick turnover merchandising methods have enabled The General Tire & Rubber Co. to continue payments on its stock and show a favorable balance sheet. During the past year the company turned over its fixed inventory twelve times. By this method the interest and fixed depreciation charges were reduced from 16 per cent, had the inventory been turned over only once, to approximately 1½ per cent.

At no time has the company made efforts to load up dealers with heavy stocks, believing that the smaller the stocks the quicker they would be exhausted, resulting in more money for the dealer and repeat orders for the company. April sales are estimated at 15 per cent larger than those of March and are practically double those of April, 1921.

William O'Neil, vice-president and general manager of the company, has compiled figures which show the manner in which taxes act to increase the price of tires to the ultimate consumer and the manner in which taxes burden the tire industry. According to these figures, The General Tire & Rubber Co. paid more in all taxes during 1921 than was paid for labor in the factory. During the same period the taxes totaled 88 per cent of the entire pay-roll of the company. Excise taxes alone amounted to $1,000 more than the direct labor charge of the company.

## Smaller Manufacturers Confident

At no time during the last few years have the smaller rubber companies in Akron shown more real optimism than is displayed at the present time. While feeling the effects of low prices, the smaller companies have been able to overcome this to some extent by being in a position to purchase raw materials at a record low market.

During the first weeks in April the smaller rubber factories began buying larger quantities of tire fabric, with the result that the market stiffened and price shading, which has characterized the market during the past year, decreased materially.

Many of the larger rubber companies are reported as rapidly working off old commitments and will be in the market for new fabric early in the latter half of the year. The smaller factories continue to buy for immediate needs. Practically no factory is covered on fabric requirements beyond the first of August, according to the best information available.

The Mohawk Rubber Co., for instance, reports that business for April will total from 33 to 50 per cent larger than in March and that this is at least a 50 per cent improvement over the same month last year. During the first three months of the present year at least three times as many cord tires were sold by the Mohawk company as during the corresponding period last year.

The American Rubber & Tire Co. is practically operating at capacity and by the beginning of May will have its plant on normal basis. During April at least 50,000 more tires were sold than during March. The bathing shoe business has developed remarkably so that the company is well sold up to July 1, the end of the present selling season in that line. At the annual meeting of the stockholders the following officers were elected: Fred H. Snyder, president; J. W. Rock, vice-president; H. L. Houk, secretary and treasurer.

The Falor Manufacturing Co., established by Shelby Falor, formerly with The Goodyear Tire & Rubber Co., reports that April sales will probably be 50 per cent over those of March, while March sales were two and one-half times those of February, which were at least 50 per cent more than recorded for January. A night shift has been started to meet the demand, but because of the high standard of the product it has required time to work up personnel.

The India Tire & Rubber Co. is busier than for many months, with its plant operating three shifts a day and export business showing a remarkable upturn. During the last month mail-order business from Sweden, England, Manila and New Zealand has shown a remarkable increase which will probably mean the establishment of an export department. Lynn Harvey has handled this department in connection with other work but will probably give all his time to it in the near future.

The Rubber Products Co., of Barberton, which has had very good business in its sundries departments, has reduced the sales cost of tires by combining the two sales departments temporarily and permitting the sundries salesmen to sell the tire line.

The Star Rubber Co. plant is operating at better than 70 per cent of normal with every indication of normal production by the beginning of June, if not sooner.

Western Reserve Rubber Co., manufacturers of specialties, principally toy balloons, is now operating at capacity, following an increase of 20 per cent in sales during the early part of April. While last year was the record year for the company, thus far this year sales have exceeded those of the same period last year by at least 15 per cent. Prices are low but have not dropped below the mark of profitable production.

The Amazon Rubber Co. operations during the first quarter of the year have been such that some profit will be shown. A new calender and mill are being added, which, when supplemented with new heaters, will materially increase capacity of the plant. The company was compelled to slow down production while new equipment was being installed.

## Akron Notes

J. W. Schade, for many years connected with The B. F. Goodrich Co.'s research department, and more recently in the boot and shoe department, has been placed in charge of the production laboratory which is under the general supervision of Dr. W. C. Geer, head of the research department.

At the annual meeting of The B. F. Goodrich Co., Akron, held April 19, all the officers were reelected, together with Messrs. Brown, Geer, Goodrich, Mason, Means and Noah as directors to serve the full 3-year term.

The Brubaker Tire & Rubber Co. has been incorporated for $400,000 by William A. Brubaker, engineer for the Akron Gear & Engineering Co., and others, to manufacture a new cushion tire which he has perfected and which has been given six months' trial, officials state. The location of the plant has not been announced. Thus far Chicago capital has been interested in the organization.

The Russell R. Gross Co., which specializes in used rubber machinery, surplus stock and salvage, has removed its offices from 311 Metropolitan building to 313 South High street, Akron, Ohio. At the new location, which is more commodious than

the one previously occupied, this firm will be better able to serve its steadily increasing list of patrons. Russell R. Gross is president of the company.

The India Machine & Rubber Mold Co., manufacturer of special rubber machinery, cores and molds, recently moved from Hill street to new quarters on Annadale avenue, Akron, where it bought the property of the Vulcan Welder Co., including approximately 25,000 square feet of land, and a one-story factory building, with 5,000 square feet of floor space. Officials of the company report a decided increase in business during the last two months, with excellent prospects for the remainder of the year. D. N. Rosen is vice-president of the company.

The M. F. Murdock Co., formerly the Union Rubber Co., is now at 266-268 South Main street, Akron, Ohio. The company carries a complete line of mechanical rubber goods, factory supplies, asbestos products, rubber boots and rubber clothing, fire-fighting and fire-prevention equipment, and druggists' rubber sundries. The personnel of the organization includes: Mark F. Murdock, president and general manager; R. C. Musson, vice-president and general manager sundries department; H. O. Murdock, secretary and treasurer; and S. L. Musson, assistant manager mechanical sales.

### Cleveland Notes

The general offices of the McGraw Tire & Rubber Co., formerly at Prospect avenue and 46th street, Cleveland, Ohio, has been removed to East Palestine, Ohio, where the company's plant is located.

The Sargent Trading Co., Cleveland Discount Building, Cleveland, Ohio, has taken over the distribution of "Quaker" tires, and will cover the larger part of Ohio, with representatives in many of the cities and towns throughout the State. A retail store was recently opened in Cleveland, at 4201 Euclid avenue, while another will soon be established in Columbus. Harrison C. Freeze is vice-president of the Sargent company.

The Du-All Manufacturing Co. is a consolidation of The Horsey Products Co. and The Harzee Manufacturing Co., with offices at 4815-4821 Lexington avenue, Cleveland, Ohio. In addition to the household and automobile products, which will be manufactured by the new concern, will be automobile-top and leather dressing, vulcanizers, and tire tube plates and patches—all under the name "Du-All." Officers of the newly-organized company are as follows: Ralph F. Henn, president and treasurer; E. C. Henn, vice-president; R. W. Wheeler, general manager, and C. O. Brandes, export manager.

### Ohio Notes

Because of the diversified line of products which The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, manufactures, it was decided to change the name of the organization to "The Marathon Company." Production is at maximum with three 8-hour shifts a day, making its capacity output 450 tires. Flexyde products require one full shift a day at present with possible increase in the near future.

Under the name of the Trump Rubber Co., a firm as yet unincorporated and comprising as members Ross M. Trump, E. H. Trump and F. G. Alderfer, all formerly connected with the Excel Rubber Co. of Wadsworth, Ohio, is now operating at 1857 East Market street, Akron, Ohio, in the plant formerly owned by The H. B. Bixler Co. The products of the new firm include belts for men and women, Ford fan belts and special molded goods, while the manufacture of rubber balls in the near future is under consideration. The output at the plant, where two shifts are now working, is about 15,000 belts daily.

Frank A. Watson, assistant manager of The Claflin Engineering Co., Lancaster, Ohio, an experienced tire-design and construction engineer, is the inventor of the "Watson Holdtite" collapsible tire core which is meeting with marked approval in practical use.

After an absence of three years, Arthur H. Nellen has resumed work in the laboratories of the Republic Rubber Corporation, Youngstown, Ohio. In the interim he has been connected with the Firestone Tire & Rubber Co., Akron, Ohio, and later acted as assistant superintendent of the Premier Rubber Co., Kansas City, Missouri.

The plant of the Long-Wear Rubber Co., Elyria, Ohio, has been resold by its purchaser, the International Rubber Company of America, Anderson, Indiana, and will not be operated as a tire factory.

## Sales Manager, Akron Rubber Mold & Machine Company

Wesley Elliot Wilson, vice-president, sales manager and assistant general manager of The Akron Rubber Mold & Machine Co., Akron, Ohio, was born in Niles, Ohio, in 1869. Following his grammar school education, he associated himself in 1892 with the Betzler & Wilson Fountain Pen Co., of which he became vice-president and sales manager.

W. E. Wilson

In 1914, Mr. Wilson became sales manager of The Akron Rubber Mold & Machine Co., and since that time has played an important part in the remarkable growth of this progressive company in the manufacture and sale of everything in tire-making equipment. He enjoys an exceptionally wide acquaintance in the rubber trade and is a thirty-second degree Mason, a Shriner, and an Odd Fellow. His clubs include the Akron City Club, Congress Lake Club, Portage Country Club, Old Colony Club and the Cleveland Yacht Club.

## The Rubber Trade in the Mid-West

### Monthly Meeting of Mid-West Rubber Manufacturers' Association

The regular monthly meeting and luncheon of the Mid-West Rubber Manufacturers' Association was held April 11, at the Hotel Morrison, Chicago, Illinois, with W. W. Wuchter, the president, presiding. At the meeting following the luncheon the principal speaker, Arnold Joerns, of the Joerns Advertising Co., Chicago, Illinois, expressed the belief that business conditions were improving; that they were better than they had been a year ago; and that they would continue to improve. Reports from several companies confirmed these statements, as the manufacturers present had noted a slow, but steady improvement in the demand for tires. Several concerns reported operating 24 hours a day, while business in general in the South was said to be showing a decided improvement during the last six weeks. The next regular meeting of the Mid-West Association will be held Tuesday, May 9.

### Midwestern Notes

The recent appointment of C. A. Hemingway, as an addition to its sales force, has been announced by the Wishnick-Tumpeer Chemical Co., importer and dealer in chemicals, oils and colors, with main offices at 365 East Illinois street, Chicago, Illinois. Mr. Hemingway, who was formerly associated for ten years with the Firestone Tire & Rubber Co., will take charge of the Ohio territory for the Wishnick-Tumpeer organization.

In a list of the recently-elected officers of the Engineering Advertisers' Association, Chicago, Illinois, appears the name of the organization's new president, Julius S. Holl, advertising manager of the Link-Belt Co., Chicago; A. K. Birch, advertising manager of Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, has also been made a member of the association's board of directors.

Construction has been resumed at Waukegan, Illinois, on the $3,000,000 plant being erected by Johns-Manville, Inc., Madison avenue and 41st street, New York, N. Y., manufacturer of asbestos products. Within a few months this company's latest factory will be in operation, according to present plans. Among the many products of the nine factories owned by Johns-Manville, Inc., are rubber and mechanical packings, brake linings, friction and rubber tapes. W. S. Lockwood is the company's advertising manager.

The works of the Quality Tire & Rubber Co., Anderson, Indiana, have been purchased by the International Rubber Company of America of the same place. The plant has been in operation since the first of April, is expanding production, and plans to produce 500 tires daily by the middle of June. H. W. Lautz is factory manager.

The Ludington Rubber Co., Ludington, Michigan, an organization which specializes in the manufacture of "Marine Armored Cord" tires, is meeting success with its product, and is considering increased operations. Officials of the company are: A. H. Gruber, president and general manager; E. C. Gruber, vice-president; A. W. Newberg, vice-president and sales manager; Fred J. Newberg, secretary; and Emil Newberg, treasurer.

T. W. Mulford has been recently appointed manager of the Kansas City, Missouri, branch of the Goodyear Rubber Co., 787 Broadway, New York, N. Y. The new official, whose headquarters will be at Eighth and Baltimore streets, succeeds Timothy Mulford who, after 53 years of service with the company, is now retiring from active business life.

## Selling Tires to the Small-Town Dealer

Tire merchandising by an unusual method is meeting with much success, according to its promotors, The Better Tires Co., 2023-2029 South Michigan avenue, Chicago, Illinois.

By the new plan of S. H. Silverman, president of the organization, tires and accessories are being sold to dealers in every state in the Union on a C. O. D., no-deposit basis, this method having been found to be especially acceptable to dealers in small towns and out-of-the-way places, often difficult for the salesman to reach. By eliminating the expense of the salesman, The Better Tires Co. claims that it can give these dealers a lower cost and permit them to do more business by passing the saving along to the consumer, the cost of sales to the selling concern being less than 6 per cent. Also by shipping all tires and accessories C. O. D., without deposit, the dealer is able to examine his purchase before paying for it, while The Better Tires Co. has less bookkeeping and all danger of losses through poor credit risks is eliminated. All orders are shipped the day they are received so that the dealer may supply his customers promptly without the necessity of carrying excessive stocks, a feature found to be appreciated.

The catalog issued by The Better Tires Co. lists, for the dealer's convenience in meeting customers' preferences, a number of different brands of tires, as well as a complete line of accessories, while various dealer helps have received special attention. These helps include a comprehensive line of price-lists and letter-service to customers, advertising copy with illustrations, picture slides, bulletins, hangers, signs, display cards, and merchandising ideas.

Tire manufacturers will undoubtedly be interested in the progress of this organization, as the problem of supplying small towns and rural districts has long been under consideration. It has been stated that fully 50 per cent of the automobiles owned in the United States are to be found in these out-lying sections, where it is unprofitable to send salesmen.

## A Decade of the Gates Rubber Co.

In the westward movement of rubber goods manufacture during the past decade the Gates Rubber Co., Denver, Colorado, stands forth as one of the earliest and most successful firms west of the Missouri River.

Charles C. Gates

This business was founded in 1912 by Charles C. Gates, at that time one of the ablest and best known mining engineers in the West. Abandoning his mining career he established, in an obscure part of the city, a small shop for the manufacture of leather covers for old automobile tires, the business being conducted under the name of the Colorado Tire & Leather Co., and later the Leather Products Co.

While this leather tread was fairly successful, Mr. Gates soon devoloped the well-known Gates Half-Sole tire, a rubber molded tread which superseded the leather cover. Several plant extensions were made during this time and in 1915 the firm, then known as the International Rubber Co., purchased a large tract of land on the south side of Denver and built the first unit of what is now one of the most up-to-date tire plants in the United States.

The half-sole tire business grew rapidly, being particularly successful during the war period when the conservation of tires was a necessity, and it is interesting that the company, then known as the Gates Co., was one of the few rubber firms in the United States operating at full capacity with the permission of the Government.

About 1917 Mr. Gates turned to the development of a high quality pneumatic tire, the Gates Super-Tread tire, which is now distributed with success all over the country.

Several new factory units were added to the plant in 1919, and the company now has a capacity of about 2,000 pneumatic tires and 2,500 inner tubes a day. In addition to this, it is the largest manufacturer of automobile fan belts in the country, and also produces an extensive line of rubber accessories, blowout patches, hose, belting, and mechanical rubber goods.

Charles C. Gates, to whose foresight, initiative and perseverance this business owes its success, was born in Pontiac, Michigan, in 1877, and is a graduate of the Michigan College of Mines. He is now identified with several manufacturing concerns located in Denver. A member of The Rubber Association of America and of the national fraternity Tau Beta Pi, he is also prominent in Masonic orders and the Shrine.

Mr. Gates attributes the successful upbuilding of the Gates Rubber Co. very largely to the Gates Club, an organization of seventy-five members, through which he has achieved remarkable cooperation among the entire executive and operative forces of the company, and given every employe an opportunity to win a voice in the firm's affairs.

# The Rubber Trade on the Pacific Coast

## Manufactured Goods

An odd slackening in demand for mechanical rubber goods, chiefly those used in the building trades, was a peculiar feature on the Pacific Coast during the past month. The almost complete cessation of buying is all the more difficult to understand when the steady increase in building permits is noted in the larger cities. Some manufacturers and dealers in mechanicals believe that builders are holding back under the impression that prices may be reduced soon because tire prices were lowered a short time ago; but rubber men look for no such reduction and say there is nothing now to justify a drop in prices. A somewhat better demand for belting, hose, valves, and packing has been coming from the mines, many of which are reopening after a shut-down of a year or more. In the oil industry the consumption of rubber shows a fair improvement over that of a month ago. The mills making garden hose report a good business, but, as expected, orders have largely fallen off of late and final deliveries of the season's production are being made. Jobbers in druggists' sundries state that a good trade has been done in the past month.

In the tire trade sales are excellent, and with some of the larger concerns are much ahead of the corresponding period a year ago. Many admit, however, that the radical price cut did not stimulate sales as much as expected, nor did it curb the "gyp" tire dealers to any considerable degree. In fact, the makers of "gyps," with light overhead and selling expense, easily kept a shade below the prices on standard makes and reaped a rich harvest on the Coast. It is even said that many tires they handled were really very good.

## Los Angeles and Vicinity

E. M. Smith of the E. M. Smith Co., rubber and asbestos manufacturer, Los Angeles, recently returned from the East, where he negotiated for the purchase of all eastern financial interests in the West Coast Asbestos Co., at Downey, California, established by the Smith company, and which will be expanded at once. The rubber and asbestos plants, it is stated, represent an investment of $1,500,000. The rubber factory on Clarence street, Los Angeles, is being enlarged and two 60-inch mills will soon be added to help double the output of rubber belting and other mechanicals.

A conference of the entire sales force of the United States Rubber Co. in Southern California was held recently at the Los Angeles branch, over which J. B. Magee, who is manager for this section of the state, presided and also made an address on up-to-date salesmanship. Other subjects were discussed as follows: "Tire Possibilities," by P. G. Stair; "Mechanical Rubber Goods Used by the Auto Trade," E. A. Branch; "Credits," P. G. Gergen; "Rubber Footwear," L. A. Hilton; "Rubber Clothing," S. E. Erickson; "Drug Sundries," W. H. Dodson; "Keds Week," T. R. Pitts.

The Samson Tire & Rubber Co., Los Angeles, by the recent additions and improvements at its tire plant at Compton, California, has practically doubled its floor space which now totals about 70,000 square feet. The new facilities, including machinery, will provide for making 1,000 cord tires, 500 fabric tires, and 2,500 tubes a day. The number of workers will be nearly doubled to total about 500.

Excellent business is reported by The Spreckels "Savage" Tire Co., of San Diego, Calif. Among recent orders was one for 10,000 cord tires from one of the largest dealers in California. A club has been formed by the employes for social and educational benefits. The officers are: Rex Brust, president; V. Quincy, vice-president; W. C. Bishop, treasurer, and E. R. Gaskell, secretary.

The Firestone Tire & Rubber Co. will open a factory branch in Phœnix, Arizona. A large office and warehouse building is being constructed for the purpose for which plans were recently completed in Phœnix.

Good headway is being made by the Columbia Tire Corporation, Portland, Oregon, on its $250,000 factory which is expected to be in full running order in two months, employing 300 men and turning out 500 tires and 500 tubes a day.

The recently-elected officers of the Sound Rubber Co., Tacoma, Washington, comprise the following: Morton Gregory, president; A. E. Braden, secretary-treasurer; and U. E. Harmon, vice-president. The above, with E. M. Hayden, Marvin Evans, R. J. Tompkins, and J. L. Carman, constitute the board of directors.

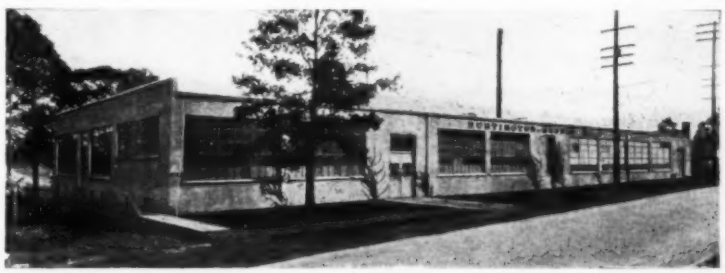
## Southwestern Notes

The 1922 crop of Pima cotton in Arizona will be about 45,000 bales, according to recent estimates. The crop is marketed mostly by the Arizona Pima Cotton Growers' Association, a cooperative society, of which Dwight B. Heard, of Phœnix, Arizona, is president. Thus far, 55,000 bales of the 1920 and 1921 crop have not been sold, but, it is claimed, all of this will be easily disposed of at fair prices well before the 1922 crop is on the market. Production of Pima in 1920 was 80,000 and in 1921, 33,000 bales.

The Smith Rubber & Asbestos Co., Houston, Texas, a subsidiary of E. M. Smith Co., Los Angeles, will manufacture hose, belting, packing, and general mechanical rubber goods. The plant will be designed, erected and equipped with modern machinery by the E. M. Smith Co., of which E. M. Smith is the president and owner.

## Huntington Rubber Mills, Portland, Oregon

A very busy, enterprising concern in the Northwest is the Huntington Rubber Mills, Macadam and Nevada streets, Portland, Oregon. The plant has modern equipment throughout, and is arranged for efficient production and the safety and comfort of its workers. The Huntington non-skid cushion heel is the chief product, the market for which is west of Denver and along the Pacific Coast. The demand for this specialty is so strong that the mills have been running night and day, almost without interruption, for four years. A good demand is also growing for non-skid soles. In addition to shoe findings, the mills make choice tire repair materials that find a wide sale. Harry Huntington, president and general manager, says that the prospects for 1922 are excellent and that the double shift may be continued for the remainder of the year.



**Plant of Huntington Rubber Mills, Portland, Oregon**

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REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

# The Rubber Trade in Great Britain

By Our Regular Correspondent

THERE is certainly some trade revival, though it is proceeding slowly. This applies to nearly all departments. With regard to the mechanical branch, adverse factors keep cropping up: the halt in shipbuilding for the navy; the dispute at the cancellation of war bonuses in the shipbuilding yards and now the engineers' lock-out. The cotton trade continues in the doldrums.

## Trade Revival Slow Despite Low Costs

Our rubber manufacturers can now obtain coal at a very low price, the collieries recouping themselves by overcharging the purchases of household coal; and not only coal but other essential materials are down, not to mention rubber at 8*d*. a pound. Wages also are down, but all this seems to avail very little against a stagnant demand and there are some who say that we must wait two or three years yet before things will become really brisk all around. Meanwhile it is not every firm that has the necessary financial position to enable it to wait philosophically. One plant started during the war in the north of England is now in the hands of a bank which is desirous of disposing of it as a going concern.

In the proofing branch things have certainly livened up, but the work is chiefly on small batches which are more trouble than a large order of the same quality of proofing. The war gave a much-needed fillip to ebonite manufacture in this country and now we have several firms turning out rods, sheets, tubes and moldings of various sorts in which they can compete successfully with continental markets.

## Golden Sulphide of Antimony Again

This pigment which has for so long been a familiar article in the rubber manufacturer's stock in trade, has again been the subject of a chemical investigation and with the usual result that previous investigators are shown to have arrived at erroneous conclusions as to its constitution. In this last paper, read by A. Short and F. H. Sharpe before the Newcastle Section of the Society of Chemical Industry, it is shown that the golden sulphide is not the pentasulphide, as commonly held, but the tetrasulphide. The carbon bisulphide extraction method of estimating the free sulphur available for vulcanization was stated to be quite reliable. This is a matter in which some difference of opinion has been expressed. The author's work was carried out at the lead works of Cookson & Co., of Newcastle, an old-established firm which has recently taken up the manufacture of golden sulphide of antimony.

## The United Rubber Products Co., Limited

This firm, whose rather peculiar methods of getting the public to subscribe to its developments were somewhat severely commented on by *Truth* two years ago, and whose exploitation of certain secret processes purchased at a high figure was not attended with conspicuous success, has sold its works and undertaking to George Spencer, a well-known figure in the rubber trade. Mr. Spencer is the head of the Monarch Rubber Co., Limited, of Manchester, also of the Monarch Waterproof Co., Limited, and the new works which he has acquired are not very far away, being in the Clayton district of Manchester. General mechanical goods, rubber soles and heels, motor and cycle inner tubes, rubber balls, dolls, toys and sponges are to be the principal objects of manufacture. The majority of the present staff is to be retained. Reverting for a moment to the old company, the first secret process, which was for the rejuvenation of old tires, was bought for £5,000 and resold shortly afterwards for £70,000. The second secret process was for making unburstable balls, and for this the company paid £35,000. A winding-up petition is down for hearing during the first week in April.

## Lead and Fume Processes

About 18 months ago reference was made in these columns to the new draft regulations issued under the Factory Act. There were several points about those regulations to which the rubber trade objected, and, the matter having been discussed with the authorities by a deputation of the India Rubber Manufacturers' Association, a revised draft has been issued and in all probability this will become law. Though the language is somewhat plainer than before, there is quite enough in the wording to frighten the small manufacturer about his "lead process." It is a "lead process" if the total weight of dry compound of lead calculated as lead monoxide contained in the mixing, when determined in the manner described in the schedule or in such other manner as shall satisfy an inspector, exceeds 5 per cent of the total weight of the mixing.

It will be rather a problem to determine how much lead calculated as monoxide the "dry compound of lead" contains. What about hypo, which is sold as such without any idea of the percentage of lead being given? Where there is no chemist on the premises to determine the lead in the mixing according to the schedule, some manufacturers will probably be inclined to give lead the go-by, or to limit themselves to the use of 5 per cent of litharge which, allowing for a little iron as impurity, will keep them outside the regulation of the "lead process."

The regulations state that no person under 16 and no female under 18 shall be employed in any lead process, and that no woman and no young person shall be employed at mixing rolls in the process of incorporating dry compound of lead with rubber. These seem quite sensible regulations; the woman mixer was evolved during the war and no doubt acquitted herself creditably, but this is a job best left to the men.

With regard to the fume process regulations, these are merely an elaboration of the restrictions connected with the use of bisulphide of carbon in the cold cure which were introduced some years ago—long after they had become imperative in the interests of health.

## Rubber Oxidation

An article contributed to our contemporary *The India-Rubber Journal*, by G. Bruni and C. Pelizzola of the Pirelli Rubber Works Laboratory, Milan, Italy, entitled "The Tackiness of Raw Rubber and the Ageing of Vulcanizing Rubber Goods," contains much of interest. The conclusions reached are that the same oxidation reactions are concerned in each case. There are two oxidation processes of different type leading to distinct classes of products: (a) brought about by ordinary oxygen with the formation of resins, (b) brought about by activated oxygen (ozone) with the formation first of peroxides and then of water soluble substance (levulinic acid and aldehyde).

It is stated that both types of oxidation take place together In order to detect this levulinic acid in decayed rubber the authors describe the following simple test to obtain what is known as the pyrrol reaction. A small piece of the rubber is covered in a test tube with crystallized ammonium acetate and heated over a gas jet until white fumes begin to develop. A splint of pine wood moistened with strong hydrochloric acid is then put into the tube and is colored crimson if levulinic acid is present.

The fact that ordinary oxygen produces resins soluble in alcohol and acetone is, of course, no novelty, though nothing is said as

to the production in vulcanized rubber of a resin insoluble in alcohol and non-saponifiable. This was what was put on record by Burghhard in his paper of 1883 and to the best of my knowledge no rubber chemist has confirmed or denied its occurrence.

In referring to the presence of water-soluble bodies in decayed vulcanized rubber the authors make no reference to the fact that such rubber when oxidized hard always contains water. A fuller paper containing all experimental details is to be published by Pelizzola in the *Giornale de Chemica Industriale e Applicata*, Milan.

## Financial Reports

The report for 1921 of the Greengate & Irwell Rubber Co., Limited, is on much the same lines as those already published by competitive concerns, in that it testifies to a period of difficulty and depression. The company was formed late in 1919 to acquire the businesses of I. Frankenburg & Sons, Limited, and the Irwell & Eastern Rubber Co., Limited, both of Salford, Manchester. The former firm was mainly concerned with proofing and the latter with mechanicals. No dividend is to be paid on the ordinary shares and after meeting the 7 per cent preference dividend—which was well taken up by the public on flotation, a balance of £2,161 is carried forward. For 1920 a trading profit of £70,585 was reported; the ordinary shareholders received 7½ per cent and £101,500 was placed to reserve.

British Insulated & Helsby Cables, Limited, in a preliminary report for 1921 shows a net profit of £430,100 against £340,700 in 1920. The plant has been largely reorganized with new additions and this work has been carried through without issuing any of the authorized new capital. The increase in the profits indicates the advantages which have accrued from the alterations and the installation of the latest plant. The reserve fund stands at over £600,000.

The Holt Town Rubber Co., Limited, of Manchester, has gone into voluntary liquidation and the works are for sale as a going concern. This is an old-established company making substitutes and rubber reclaims and changed hands a year or two ago.

Sir Arthur Whinney has been selected as the expert accountant to inquire into the circumstances leading up to the disastrous balance sheet recently issued by the Dunlop Rubber Co., Limited, and will act with the previously appointed committee, viz.: Messrs. Thompson, Sobey and Sir Josiah Stamp.

# The Rubber Trade in Europe

## France

### Company Notes

The Pneumatiques Dunlop, Paris, reports a loss of 3,948,552.89 francs for the past business year. It is proposed to pay off 1,500,000 of this amount by using the company's provident funds. After deducting this amount and 26,012.16 francs carried over from the previous profit and loss account, the loss amounts to 2,422,540.73 francs. The directors are Louis-Michael Bergin, Auguste Dutreux, Lord Charles Montagu, Charles Archibald Proctor, Jean Petavy and Louis Rebière.

The Société des Manufactures Françaises Réunies de Cuirs, Peausseries, Courroies Caoutchoucs, capitalized at 10,000,000 francs, has been declared bankrupt. The company's offices were in Paris and their factories in Chateaurenault (Indre-et-Loire) and Romans (Drôme.)

At an extraordinary meeting of the Société Picollet, Paris, it was decided that this concern, capitalized at 2,700,000 francs, should continue its operations.

The Manufacture Mart & Cie. (De La Croix, Le Mercier & Cie.) is a new company formed to manufacture and sell rubber goods of all kinds. The offices are in Paris.

Société Albax, Paris, has just been organized and will manufacture and sell plastic materials.

The Forestière Sangha-Oubanghi reports that it has secured renewal of its concession for rubber under extremely favorable conditions. It has placed a claim of indemnity against Germany not only for damages during the war but also for material losses and the lack of gain resulting from violations of contract on the part of the German Government. As is known, as a result of an agreement of 1911, the company became a concessionary of the German Government in the Kamerun. Its claim is for 11,775,129 francs less 1,167,273 francs for English war risk insurance.

### French Imports of Rubber Goods

During 1921, France imported rubber goods to a total value of 60,173,000 francs. Of this, England supplied the largest part, 32,240,000 francs; next came Belgium with 8,532,000 francs; United States, with 8,357,000 francs; Italy, with 6,589,000 francs; and other countries, 4,455,000 francs.

## Russia

*L'Information* learns that in October last there were altogether four rubber factories working in Russia, employing a total of 7,920 persons. The production is, of course, much below that of 1914, but it is reported that good progress is now being made and that supplies of crude rubber are ample.

## Sweden

The cartel of the Swedish rubber shoe manufacturers is at present occupying a prominent position in Sweden's business life. Before the cartel came into existence in 1910 there was sharp competition among the biggest four Swedish rubber shoe manufacturers, the Hälsingborg Gummifabriks A.-B., Svenska Gummifabriks A.-B., Skandinaviska Gummifabriks A.-B. and Ryska Gummifabriks A.-B., which are now combined in the cartel. Even before the war, these factories controlled the local market and after the importation of Russian rubber footwear ceased, all foreign competition was cut off because no other country produces the particular kind of shoe which taste and circumstances in Sweden require. Consequently the cartel practically monopolizes this business. The cartel decides questions of production, prices and conditions. The quantity to be produced is divided among the factories according to a special agreement. Retail prices are also fixed by the cartel. The net profits of the cartel during 1911-1920 amounted to 35,000,000 Swedish kroner (one krona equals $0.268 normal United States currency), the paid-up capital of the enterprise is 4,400,000 kroner. Both German and American competitors have tried to find a market in Sweden for rubber shoes, but failed because foreign manufacturers did not sufficiently take into consideration the peculiarities of Swedish taste. At one time, however, the Swedish cartel seemed to fear German competition and applied to the government to forbid the importation into Sweden of rubber shoes of German make.

## Germany

### Prices

Prices for rubber goods continue to rise. Technical goods are up 25 per cent more; jar rings cost 170 to 200 marks per kilo (a kilo is equal to 2.2 pounds); washers for bottles cost 150 to 180 marks per kilo, the price of seamless rubber goods is now 250 per cent higher; the so-called "patent" rubber articles, including tobacco pouches, are 160 per cent higher than they were before the sudden rise began; tubing costs 456 marks per kilo. Hard rubber goods are 160 per cent above usual price; bathing caps and sponge bags 120 per cent; catheters 130 per cent; mineralized rubber goods 130 per cent. The new prices for tires and treads have been increased as follows: Plain automobile tires, 15 per cent; tires with design, 10 per cent; covers with

rivet non-skid arrangement, 10 per cent; cord tires 5 per cent; automobile tubes, 10 per cent; solid tires for trucks, 15 per cent; bicycle and motorcycle tires, 10 per cent.

Below are tables showing the course of prices for some tires from August 5, 1920, to November 10, 1921:

PRICES FOR RUBBER NON-SKID CASINGS

| *Sizes in mm.* | 650 x 85 | 760 x 100 | 820 x 120 | 895 x 135 |
|---|---|---|---|---|
| August 5, 1920.....*marks* | 1051 | 1440 | 2107 | 2758 |
| May 1, 1921 ..... | 946–956 | 1296–1310 | 1897–1917 | 2482–2510 |
| November 10, 1921 ..... | 1647–1688 | 2236–2294 | 3385–3470 | 4338–4446 |

PRICES FOR INNER TUBES

| *Sizes in mm.* | 650 x 85 | 760 x 100 | 820 x 120 | 895 x 135 |
|---|---|---|---|---|
| August 5, 1921.....*marks* | 170 | 214.50 | 275 | 322 |
| May 1, 1921..... | 144 | 182 | 233 | 273 |
| November 10, 1921..... | 246 | 304 | 399 | 457 |

PRICES FOR SOLID TIRES (INCLUDING STEEL BAND)

| *Sizes in mm.* | 860 x 90 | 920 x 110 | 1010 x 120 | 1030 x 140 |
|---|---|---|---|---|
| August 5, 1920.....*marks* | 1299 | 1957 | 2397 | 2816 |
| May 1, 1921 ..... | 909–915 | 1358–1360 | 1675–1680 | 1976–1990 |
| November 10, 1921 ..... | 1525 | 2268 | 2793 | 3321 |

### Company Notes

The Franz Clouth, Rheinische Gummiwarenfabrik Aktiengesellschaft, Köln-Nippes, has reestablished connection with the Land- und Seekabel-Werke Akt.-Ges., Köln-Nippes. The latter firm had been founded as an independent stock company by the late Franz Clouth. In an exchange of stock, all of Franz Clouth Aktiengesellschaft stock was transferred to the Land- und Seekabel-Werke, most of whose stock is in possession of the Felten & Guilleaume Carlswerk Aktiengesellschaft, Köln-Muhlheim. Business in all the enterprises is very satisfactory.

The Continental-Caoutchouc-und-Gutta-Percha-Compagnie, Hanover, proposes to declare a dividend of 30 per cent and a bonus of 15 per cent. The expansion of business requires a considerable increase in the working capital; consequently the question of doubling the capital, thereby bringing it from 67,500,000 to 135,000,000 marks, will be brought forward at a general meeting to be held shortly. Besides this, it will be decided to issue a further 15,000,000 shares for special purposes. The preferential shares will be increased in proportion.

## Foreign Tariffs

### Australia

Additions have been made to the list of articles which may be imported into Australia at the present rates of duty. Among these and under the heading "Minor Articles for Use in the Manufacture of Goods Within the Commonwealth," are included rubber tires (solid)—band steel (grooved), 3 inches to 14 inches in width. Under the heading "Machine Tools and Parts," are mentioned rubber working—automatic trimming machines.

### Mexico

According to presidential decrees of January 28 and February 13, certain goods exported from Mexico are now subject to changes in duties. Rubber and guayule rubber, for instance, which formerly were taxed 0.11 pesos (one peso equals $0.44 normal United States currency) per gross kilo, are now under the new ruling, free from all duty.

### New Zealand

Some decided changes have been made in the import duties of New Zealand, the principal alteration in actual rates as compared with the former tariff being the considerable extension of the system of preferential rates to British products. Among the articles subject to increased duties are mentioned automobile tires, free to 25 per cent, and bicycle tires, free to 10 per cent. Rubber goods, other than tires, formerly free to 33⅓ per cent, have now a tax of from 10 to 20 per cent. Belting, except of leather, with a former duty of 10 per cent has now a tax of 20 per cent.

### Peru

The Peruvian Ministry announces that the collection of export duties on rubber, with the exception of balata, shall, in the departments of Loreto and Madre de Dios, be suspended until June 30, 1922, in conformity with the decree of February 15, 1922.

### Spain

The new Spanish tariff, which went into effect February 16, contains many alterations, many of which particularly concern the rubber industry. These changes are in detail as follows:

| Item No. | Articles | Former Duty Pesetas* | Present Duty Pesetas |
|---|---|---|---|
| | Rubber manufacturers, gutta percha, and similar products: | | |
| 1493 | In tubes weighing less than 15 grams per meter .....*kilo net* | 2.60 | 6.00 |
| 1494 | In tubes weighing from 15 to 50 grams, inclusive, per meter.....*kilo net* | 2.60 | 3.60 |
| 1495 | In tubes weighing more than 50 grams per meter .....*kilo net* | 2.60 | 2.50 |
| 1497 | Manufactured into transmission belts, disks or valves for machinery, and horseshoes, whether mixed or strengthened with other materials or not.....*kilo net* | 4.00 | 4.00 |
| 1498 | Tires ("bandajes") solid, for carriages, *kilo net* | 4.00 | 3.50 |
| 1499 | Tires ("bandajes") with metallic mounting .....*kilo net* | 2.40 | 2.40 |
| 1500 | Inner tubes for pneumatic tires, used or not .....*kilo net* | 5.40 | 8.00 |
| 1501 | Casing for pneumatic tires, used or not, *kilo net* | 5.40 | 6.00 |
| 1502 | Articles for hygienic, orthopedic, and medicinal use, without admixture of other materials .....*kilo net* | 8.00 | 8.00 |
| 1503 | Combs, hairpins, and hatpins ....*kilo net* | 8.00 | 6.00 |
| 1504 | Shoes, heel pieces, and pieces for shoes, although containing other material except leather .....*kilo net* | 6.00 | 5.00 |
| 1506 | In articles, not specified, with or without parts of other materials.. .....*kilo net* | 8.00 | 7.00 |
| 1507 | Tires, pneumatic tires and inner tubes cut into pieces less than 0.50-meter 100 *kilos net* | (†) | 15.00 |
| | Same, cut into strips of a width less than 0.05-meter .....100 *kilos net* | (†) | 1.00 |
| 1491 | Elastic rings and armlets; bands up to 3 mm. thick and up to 5 cm. wide, for insulating electric wire and cables; guiding belts for the manufacture of paper; and billiard table cushions.....*kilo net* | 8.00 | 6.00 |
| 1496 | Hose pipes or tubes, rings and sheets, not specified, washers, machine packing, and door mats, even if strengthened with textile fibers or iron, brass or other wire; and tiles for paving, with or without parts of other material.....*kilo net* | ‡2.60 or 4.00 | 2.30 |
| 1525 | Toys and games of rubber or like material, *kilo net* | 6.00 | 8.00 |

*One peseta equals $0.195 normal United States currency.
†Where two rates are given such as 45 to 60 pesetas, more than two classifications are signified with sliding rates varying between these given; when two rates are given such as 45 or 60 pesetas, two classifications are signified with different rates according to classification.
‡Pesetas per kilo.

### Union of South Africa

The South African Commissioner of Customs announces certain changes regarding the importation of goods into that country. Among the articles particularly mentioned as being subject to duty are tire wrapping machines, which have a general tariff of 20 per cent ad valorem, but a rebate of 3 per cent ad valorem upon goods which represent the manufacture of the United Kingdom or reciprocating British Colonies.

## UNITED STATES LEADS IN BRAZILIAN TIRE REPAIR TRADE

Consular reports from various sections of Brazil coincide in the statement that the United States controls the Brazilian tire repair trade. While there are probably not more than 17,000 automobiles in use in Brazil, the market for vulcanizing equipment and tire repair material is in the hands of United States manufacturers, with Italy, France, England and Germany as unimportant competitors. It is believed that by more extensive advertising, and by sending representatives to the field to explain the proper use of the goods, sales of repair vulcanizers and materials could be increased.

# The Rubber Trade in the Far East

## Malaya

Towards the end of last year when rubber was steadily rising in price, many thought that the corner in the rubber slump had been turned and that if no big profits were in store in the immediate future, at least enough would be made to keep things going reasonably well. Many opponents of restriction took occasion to preen themselves on their superior judgment; there was much talk about stocks and more than a few suggestions that they were much lower than would appear from figures published; quite a number of directors hurriedly called to their managers to produce to capacity. And so not a few estates produced all they could in spite of warnings from the press not to be so hasty. Rubber has dropped to 27 cents again and, according to some the end is not yet. These say that while the more distant future of rubber is encouraging they can see nothing but gloom immediately ahead unless something unexpected happens. One planting authority says that while the effect of the orders to increase production will not be felt immediately because of the intervention of the wintering season, considerably larger quantities will appear on the market from midsummer onward. Unless something unexpected happens, this authority holds that in the end Americans will buy up estates right and left and the control of the rubber industry will pass out of the hands of the British into those of the big American manufacturing groups.

Aside from overproduction, the danger of disease is a cause for worry. At the best of times the danger of some epidemic among the trees had been taken into consideration and warned against. Now when not only native and Chinese estates but also formerly well-kept European estates are neglected, there is greater reason for anxiety than ever. When rubber began to slump and economy was the order of the day, practically the first measure of retrenchment was the cutting out of "unnecessary" tasks which unfortunately, in many cases, if not in most, included the rational upkeep and care of estates. One local paper expresses the fear that this neglect may result in some epidemic of disease among the trees which will bring about restriction in a way not looked for.

Thus, if the discovery daily of some new use for rubber adds to the promise for the more remote future, the immediate prospects of the commodity appear to be gloomy enough.

### Malayan Notes

During the last quarter of 1921, imports of automobiles and parts amounted to $500,000 (Straits currency) as compared with $8,500,000 for the corresponding period last year.

It is reported that a well-known European firm in Malaya has secured the option for $1,000,000 on the invention of the Johore planter-chemist for the production of rubber articles manufactured direct from the latex within 24 hours after tapping, as described recently. Rumor has it that a well-known retired Malayan official is making efforts to float a big company in England.

## Ceylon

### Rubber Yields

An experiment is being carried out at Peradeniya on a block of rubber planted in June, 1912, from seed of a tree which has given the largest recorded yield of rubber in Ceylon. After thinning out there are 90 trees to the acre. Tapping was commenced on April 1, 1921, one cut on the half at 24 inches from the ground at an angle of 16 degrees, tapping on alternate days. The yield from the whole block (1.78 acres) for nine months ended December 31, 1921, is 759 pounds of dry rubber, 426 pounds per acre or 4.08 pounds per tree. Of the trees seven gave between 5 and 6 pounds each, 42 between 4 and 5 pounds; 76 between 3 and 4 pounds; and 36 between 2 and 3 pounds. The average girth for the whole block was 31.49 inches at three feet from the ground at the commencement of the experiment. The girth of the highest yielders averaged 35.48 inches; of the lowest yielders 27.19 inches. At the same time it was noted that the best yielders with best growth were somewhat more favorably situated as regards light and air than the rest. The average increase in girth per tree in the whole block during the nine months is 2.56 inches.

### Rubber Novelties

The rubber depression, by stirring the inventive faculty of planters, is responsible for yet another novelty, namely a lady's vanity bag of rubber. This is being turned out by the Ceylon Plantation Rubber Manufacturing Co., Matugama, of which the managing proprietor is Edwin A. Peiris, a diploma holder of the School of Tropical Agriculture.

## Netherlands East Indies

### Taxes on Rubber Companies in Java

According to details published, the new taxes for rubber companies in Java will be as follows:

(1) Ordinary tax at the rate of 6 per cent on profits.
(2) Extra profits tax on a graduated scale.
(3) Dividend tax at the rate of 10 per cent on the total dividends declared in respect of any one year in excess of 8 per cent on the issued capital.

The extra tax is based on the profits in excess of given percentages of the issued capital. Thus, 6 per cent is payable on the profits which exceed 10 per cent of the capital; 8 per cent on the profit in excess of 25 per cent; 10 per cent on that over 50 per cent and 12 per cent of profits in excess of 100 per cent. The amounts payable under the four degrees of the extra profits tax scale are cumulative, and the amount payable under each degree is not allowed as a deduction in arriving at the excess chargeable under the next higher degree. The amount of capital issued plays an important part in the matter of calculating the taxes which bear more lightly on the profits of highly capitalized companies than on those of concerns with small capitals in proportion to earning capacity.

It will be remembered that strong protest was entered against the passing of the law providing for these new taxes and that foreign capital particularly was much disgusted. However, it seems that protests have availed little and that the new system of taxing will be enforced in spite of warnings that thereby much foreign capital would be diverted from the Dutch colonies to the neighboring French and British possessions.

### Netherland Indies Notes

The rubber factory at Bandoeng, Java, suffered during the latter part of last year from the general depressed condition of business. Nevertheless, in spite of lower prices and fewer orders, a clear profit of 50,000 gilders was made. This is about twice as much as was made the year before and is ascribed to improvement in the process of manufacture. Owing to present business conditions, this sum was written off. At the moment satisfactory orders are coming in.

The directors of the Rubber Plantation Company Soengey Raja, now in liquidation, announce that an agreement has been made with an English group regarding the Gadjah Meuntah estate with concessions in Atjeh, Sumatra. This estate will be exploited by an English company, yet to be organized, with a share capital of £50,000 preferential shares (preferential for 10 per cent dividend and for their nominal value at liquidation) and £20,000 common stock. The Soengey Raja will receive £20,000 preferential shares and £30,000 preferential shares will be paid up by the English group to cover costs of establishing the concern and to supply working capital. The agreement also provides for immediate payment of overdue taxes to the government.

The Soengey Raja company retains its Java estate Tjikantjana.

# Recent Patents Relating to Rubber

## The United States

### Granted March 7, 1922

No. 1,408,500 Ear device for the deaf. C. Clark, Los Angeles, Calif.
1,408,530 Dental instrument. O. H. Larsen, Chicago, Ill.
1,408,544 Inner lining and reenforcement for pneumatic tires. F. X. Schuler, Fort Worth, Tex.
1,408,701 Solid tire. C. V. Honecker, Brookville, Ind.
1,408,714 Resilient tire. C. S. Preston, San Diego, Calif.
1,408,721 Elastic heel retainer for low shoes. A. M. Carrel, San Francisco, Calif.
1,408,893 Rim for tires. G. E. Kricker, assignor to The Standard Parts Co.—both of Cleveland, O.
1,408,959 Cap for pneumatic tire valves. W. R. Royer, Wilkes Barre, Pa.
1,409,005 Rim for tire. O. H. Jobski, assignor to The Standard Parts Co. —both of Cleveland, O.
1,409,021 Punctureproof cushion tire. D. E. Patton, Fort Worth, Tex., assignor to C. R. Parker, North Little Rock, Ark.
1,409,065 Fountain pen. J. Ring, Youngstown, O.
1,409,070 Resilient heel. A. Troiano, Washington, D. C.
1,409,125 Rubber step-plate for automobiles. F. H. Stanwood, assignor to Stanwood Equipment Co.—both of Chicago, Ill.

### Granted March 14, 1922

1,409,151 Tire. C. J. Carlson, Helena, Mont.
1,409,263 Tire. J. B. Wallace, Mukwonago, Wis.
1,409,355 Hose supporter. H. A. Austin, Chicago, Ill.
1,409,374 Pneumatic cushion. J. J. Halloran, Daly City, Calif.
1,409,453 Air-tube valve. J. J. Kinehan, Los Angeles, Calif.
1,409,601 Tire patch. R. A. Spink, Oshkosh, Wis.
1,409,611 Disk for flexible couplings. R. J. Stokes, Trenton, assignor to Thermoid Rubber Co., Hamilton Township.—both in New Jersey.
1,409,613 Fountain pen. R. Strasser, New York, N. Y.
1,409,616 Fountain pen. L. Taddeo, Cleveland, O.
1,409,617 Fountain pen. L. Taddeo, Cleveland, O.
1,409,619 Rubber device for typewriter platen scale. A. K. Taylor, Baltimore, Md., assignor to Underwood Typewriter Co., New York, N. Y.
1,409,692 Rubber heel with extension under shank of shoe. H. M. Follweiler, Hazelton, Pa.
1,409,734 Demountable rim for tires. F. A. Lane, Shelburn, Ind.
1,409,752 Wringer. E. D. Misner, Detroit, Mich.
1,409,762 Pneumatic punctureproof single tube tire. D. and G. Patchin, Shawnee, Okla.
1,409,771 Cushion tire. J. R. Place, Detroit, Mich.
1,409,774 Vehicle tire. C. S. Preston, San Diego, Calif.
1,409,795 Resilient tire. H. J. Stewart, Canton, Okla.
1,409,866 Garter purse. E. A. Kendall, San Francisco, Calif.

### Granted March 21, 1922

1,409,907 Thickness gage for sheet material. A. O. Abbott, Jr., Detroit, Mich., assignor to Morgan & Wright, a Michigan corporation.
1,410,046 Demountable disk wheel for pneumatic tires. W. E. Williams, Chicago, Ill.
1,410,067 Pneumatic tire rim. M. McGlochlin, Price, Utah.
1,410,079 Rubber button combined protector and fastener. E. Quinn, Brooklyn, N. Y.
1,410,179 Demountable rim for tires. P. Hien, Chicago, Ill.
1,410,237 Water-bottle or like closure. F. E. Baldwin, Philadelphia, Pa.
1,410,297 Tire deflation signal. F. D. Harman, Cedar Falls, Wash.
1,410,339 Elastic hand surgical appliance for men. J. J. Martinka, Newark, N. J.
1,410,435 Parachute. W. W. Whaley, Wilmington, N. C.
1,410,438 Inflatable life-saving float. E. T. Willows, London, Eng., and W. J. Austin, Swansea, Wales; said Willows assignor to said Austin. (Granted under the provisions of the act of March 3, 1921, 41 Statute Law, 1313.)
1,410,475 Tire. W. S. Johnston, Detroit, Mich.
1,410,483 Vulcanized rubber tee with sliding weight. A. E. Lard, Washington, D. C., assignor to The Metallic Shaft Co., Wilmington, Del.
1,410,501 Detachable wire-spoked wheel for pneumatic tires. W. H. Paull, Birmingham, assignor to The Dunlop Rubber Co., Limited Regent's Park, London.—both in Eng.
1,410,513 Garter and method of manufacture. L. Platt, New York, N. Y.

### Granted March 28, 1922

1,410,605 Protective cap for bottles, etc. W. F. Schacht, Huntington, Ind.
1,410,630 Inner tube for pneumatic tires. N. G. Warth, Gallipolis, O.
1,410,669 Cushion tire. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y. (Original application divided.)
1,410,704 Tire. M. P. Mitchell, Eaton, O.
1,410,859 Envelope-sealing mechanism with rubber rollers. W. H. Wheeler, assignor to Pitney-Bowes Export Corporation.—both of Stamford, Conn.
1,410,892 Pressure rim for truck tires. T. W. Costello, San Francisco, Calif.
1,410,926 Pure-air hood and helmet. J. W. Knoblock, assignor to American La France Fire Engine Co., Inc.—both of Elmira, N. Y.
1,410,927 Respirator mask. J. W. Knoblock, assignor to American La France Fire Engine Co., Inc.—both of Elmira, N. Y.
1,410,928 Respirator. J. W. Knoblock, assignor to American La France Fire Engine Co., Inc.—both of Elmira, N. Y.
1,410,929 Hydrometer. L. P. Larose, Worcester, Mass.
1,411,160 Garment supporter. T. L. Caudle, Wadesboro, N. C.
1,411,200 Vacuum cup nonslip device for footwear. J. G. Zertuche, Mexico City, Mexico.

## The Dominion of Canada

### Granted February 28, 1922

216,208 Golf appliance and exercising device. H. W. Smith, Akron, Ohio, U. S. A.
216,213 Hose clamp. J. L. Thompson, Centerville, Ia., U. S. A.
216263 Syringe hydrometer. The Scranton Glass Instrument Co., Inc., assignee of R. A. Amerman—both of Scranton, Pa., U. S. A.
216,270 Hose mender. F. Hachman, and W. H. Gregg, assignee of ½-interest—both of St. Louis, Mo., U. S. A.

### Granted March 7, 1922

216,366 Combination solid and pneumatic tire. J. E. Harrigan, New York City, U. S. A.
216,396 Auxillary sectional tire. F. G. Paine, Los Angeles, Calif., U. S. A.
216,404 Tire casing. H. Raflovich, Buffalo, New York, U. S. A.
216,465 Inner tube for pneumatic tires. The Climax Rubber Co., Columbus, O., assignee of R. C. Spratling, Opelika, Ala.—both in U. S. A.
216,552 Tire valve. J. G. Pelton, G. T. Kelly and W. R. Pelton, assignee of ¼-interest—all of Portland, Ore., U. S. A.
216,576 Door buffer. S. G. Lewis, Greensburg, and G. W. Daum, Jeannette, coinventors—both in Pa., U. S. A.

### Granted March 14, 1922

216,839 Tire bead construction. The Fisk Rubber Co., Chicopee Falls, assignee of T. Midgley, Hampden—both in Mass., U. S. A.
216,854 Cushion tire. The Lambert Tire & Rubber Co., Akron, O., assignee of H. M. Lambert, Portland, Ore.—both in U. S. A.
216,868 Inflated ball. Paramount Rubber Consolidated, Inc., assignee of F. T. Roberts—both of Philadelphia, Pa., U. S. A.

### Granted March 21, 1922

215,935 Hose coupling. E. Edelmann, Chicago, Ill., U. S. A.
216,956 Knee pad with elastic straps. E. N. Kauffman, Mahaffey, Pa., U. S. A.
216,967 Inner tube receptacle. J. H. Mills, Gallipolis, Ohio, U. S. A.
217,032 Parachute. The Jahn Aerial Life Saving Apparatus Co., assignee of L. B. Jahn—both of Montevideo, Minn., U. S. A.
217,054 Solid tire. E. Erik, assignor, Ossining, and B. and I. Pindek, each assignee of one-fourth interest, Brooklyn—both in New York, U. S. A.
217,125 Water bottle stopper. H. P. Kraft, Ridgewood, New Jersey, U. S. A.
217,126 Dust cap for tire valves. H. P. Kraft, Ridgewood, New Jersey, U. S. A.
217,153 Tire-valve nut and dust cap. M. C. Schweinert, New York City, U. S. A.
217,154 Water-bottle stopper. M. C. Schweinert, New York City, U. S. A.
217,162 Demountable rim for tires. E. J. Sterling, Acme, Alberta.
217,195 Bridge washer for valve stem. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in U. S. A.
217,196 Spreader for pneumatic tires. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in U. S. A.
217,197 Tire valve. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in U. S. A.
217,198 Tire valve. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in U. S. A.

### Granted March 28, 1922

217,272 Resilient recoil pad for gun stocks. L. F. Kennedy, St. Paul, Minn., U. S. A.
217,273 Device for inflating tires. J. F. Key, Sierra Madre, Calif., U. S. A.
217,394 Resilient wheel. R. R. Rumney and H. M. Patch, coinventors—both of Seattle, Wash., U. S. A.

## The United Kingdom

### Published March 1, 1922

173,773 Respirators. Inhabad Gesellschaft, 9 Marchstrasse, Charlottenburg, Berlin, Germany. (Not yet accepted.)

### Published March 8, 1922

173,909 Tire interliner. A. Franklin, Hermetic Works, Ryland street, Birmingham.
173,914 Rubber hand-grips for rackets. T. Lloyd, 12 Bridge street, Manchester.
173,964 Rubbing surfaces of turbines, centrifugal or reciprocating pumps, etc., faced with soft tough rubber. R. C. Parsons, 39 Victoria street, Westminster.
173,984 Revoluble rubber heel protectors. J. P. Haworth, 3 Grove Terrace, Highgate Road, London.

**Chemical Patents will be found on pages 548-549. Machinery Patents on pages 554-555.**

173,985 A sole or heel of leather punched with recessed holes to accommodate rubber studs. W. H. Hansell, 2 Hans Place, Cromer, Norfolk.
173,987 Tire valve. A. L. Cheek, 2B Jennings avenue, Fort Worth, Tex., U. S. A.
173,993 Fly on waterproof garments. G. Abrahams, 16 Marshall Place, Cheetham Hill, Manchester.
174,010 Golf balls. The B. F. Goodrich Co., 1780 Broadway, New York, N. Y., assignee of H. A. Hoffmann, 802 West Exchange street, Akron, O.—both in U. S. A.
174,100 Heel protector. W. D. Sternberg, 19 City Road, London.

### Published March 15, 1922

174,257 Pneumatic tire. J. Hobson, Route 1, Box 226, Colton, Calif., U. S. A.
174,277 Soothing teats. C. E., C. W. and E. P. Leheup, 156 Norman Road, Leytonstone, London.
174,285 Toy boxing figure with rubber arms. E. Baxter, 42 Alexandra Road, South Shore, Blackpool.
174,291 Inner tube. J. A. Andrews, 4 Marldon avenue, Great Crosby, Liverpool.
174,314 Wheel tire with resilient tread blocks. C. Barthe, Coulza, Aude, France. (Not yet accepted.)

### Published March 22, 1922

174,371 Pan scraper with rubber blade. F. Beuckmann, East St. Louis, Ill., U. S. A. (Not yet accepted.)
174,376 Pneumatic tire with sectional air chamber. O. Trampusch, 22 Alexanderstrasse, Augsburg, Germany. (Not yet accepted.)
174,466 Rubber soles molded with integral flat, horizontal or double flanges to which the uppers are directly attached. R. Russell, Strathmoor, Lands End, Rhodes, Lancashire.
174,468 Pneumatic-tire pressure gages. I. Pulverman, Exchange Hotel, Warren, Pa., U. S. A.
174,543 Elastic device for securing hat to the head. E. M. Newlands, Glencoe, Freshwater Bay, Isle of Wight.
174,565 Two-part rubber heel. W. H. Clarke, 95 King street, East, Toronto, Canada. (Not yet accepted.)

### Published March 29, 1922

174,637 Elastic fastenings for aircraft-landing gear. L. Schreck, Quai de Seine, Argenteuil, Seine-et-Oise, France. (Not yet accepted.)
174,710 Inflatable rubber tube as shape retainer for soft caps. W. Fraser, 11 Mill Hill, Musselburgh, Midlothian.
174,761 Light and flexible hat or cap made by forming sheet cork treated with rubber. E. W. Vero, 49 East Dulwich Road, London.
174,825 Detachable rim for tires. H. Schaechterle, Friend, Neb., U. S. A.
174,861 Sponge enclosed in molded rubber casing as cleaning device for golf balls. E. J. Byrne, 3 Albemarle street, Piccadilly, London.
174,870 Tire valve. G. F. Powell and J. Barr, 37 Yonge street, Toronto, Canada.
174,889 Catamenial appliance. E. A. Cookson, 34 Lord street, Southport, Lancashire.
174,903 Surgical cupping appliance with non-return valve formed by rubber membrane. P. Mahieu, 41 rue d'Hautpoul, Paris, France. (Not yet accepted.)
174,906 Wheel tire filled with balls of rubber. C. Montalcini, 24 via Silvio Pellico, Turin, Italy. (Not yet accepted.)

## New Zealand

### Published January 26; Issued February 9, 1922

44,251 Rubber sole and heel. J. Brandwood, Brandlesholme, Bury, Lancaster, and A. Thill, 5 Gordon Place, London, W. C.—both in England.
45,387 Garden hose holder. R. G. Macey, State Rivers and Water Supply Commission, Treasury Gardens, Spring street, Melbourne, Victoria.

### Published February 9; Issued February 16, 1922

46,886 Fountain pen. A. Winter, 342 Madison avenue, New York City, U. S. A.
46,950 Milking-machine teat-cup. C. H. Davis, 49 Ridgway street, Wanganui, N. Z.

## Germany

### Patents Issued, with Dates of Issue

350,825 (March 16, 1921) Bougie. Dr. Albrecht Meyenberg, Potsdamerstrasse 27 b., Berlin.
351,312 (July 10, 1920) Elastic heel patch of rubber and the like. John George Tufford, Elyria, Ohio, United States; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, all of Frankfort-on-the-Main, and T. R. Koehnhorn, Berlin, S. W. 11.
351,365 (May 13, 1919) Pneumatic tire. Dr. Fritz Fuchs, Vienna; represented by Dr. Friedmann, Berlin W. 50.
351,366 (January 25, 1920) Pneumatic tire. Charles Lancaster Marshall, London; represented by R. Geissler, Berlin S. W. 11.
351,613 (July 10, 1920) Elastic hollow tire. Emile Carpentier, Liège, Belgium; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, all of Frankfort-on-the-Main, and T. R. Koehnborn, Berlin S. W. 11.
351,620 (April 26, 1921) Heel with rubber patch. Otto Maser, Costritz, near Dresden.
351,912 (October 12, 1920) Fastening cushion tire with solid rubber cushions. Demetrio Mazziora, Florence, Italy; represented by C. Fehlert, G. Loubier, F. Harmsen, E. Meissner all of Berlin S. W. 61.
353,088 (June 16, 1921) Fastening of rubber tires and cords. Alexander Giegold, Mannichswalderstrasse 58, Krimmitschau.
353,141 (October 19, 1920) Injection syringe kept in alcohol container. Wilhelm Heinrich Gerhard van der Ven, Rees-on-the-Rhein.

# Trade Marks

## The United States

### Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

### Granted March 7, 1922, Act of February 20, 1905

152,723 Conventionalized monogram and outline—dental rubber, etc. Claudius Ash, Sons & Co. Limited, London, Eng.
152,769 IF IT'S FEDERAL IT'S RIGHT in white letters on black disk—repair gums, rubber cement, etc. Federal Rubber Co., Cudahy, Wis.
152,815 POLO—erasers. Egon Hassinger, Barcelona, Spain.
152,844 KENTUCKY THOROUGHBRED with representation of horse's head inside conventionalized tire—tire pumps, grease guns, tool kits, etc. Kentucky Tire Pump Co., Madisonville, Ky.
152,885 BLUE RIBBON—water-bottles and bags, syringes, etc. The Miller Rubber Co., Akron, O.
152,932 CASCADE—hot-water bottles. R. Palmer, New York, N. Y.
152,934 BILLY BOUNCE—toy rubber balls. Panther Rubber Manufacturing Co., Stoughton, Mass.
152,976 EAGLE TWILL—brake lining. The Russell Manufacturing Co., Middletown, Conn.
152,983 SANITANT—vaginal douches. Sanitant Manufacturing Co., Inc. New York, N. Y.
152,992 PLAYGROUND—fabric, rubber, rubber composition and leather shoes. Shaft-Pierce Shoe Co., Faribault, Minn.
153,012 HICKORY—rubber sheeting. A. Stein & Co., Chicago, Ill.
153,037 HUSKIE—tires and tubes. The United Rubber Co., Akron, O.
153,059 KIDDIE KAR SPECIAL—rubber-tired three-wheeled coasters for children. H. C. White Co., North Bennington, Vt.

### Renewals

17,710 RELIABLE within an elliptical design—hydraulic hose and machine belting. Registered March 25, 1890. New Jersey Car Spring and Rubber Company, Jersey City, N. J. Renewed March 25, 1920.
18,707 DIAMOND—hydraulic fire-hose and machine belting. Registered December 16, 1890. New Jersey Car Spring and Rubber Company, Jersey City, N. J; New Jersey Car Spring & Rubber Co., Inc., a New York Corporation, assignee. Renewed December 16, 1920.
20,911 FAIR—armpit shields. Registered March 29, 1892. The Brooklyn Shield Co., Brooklyn, N. Y.; Brooklyn Shield & Rubber Co., a New York corporation, assignee. Renewed March 29, 1922.
20,970 COMMON SENSE within an ellinse—armpit shields. Registered April 12, 1892. Brooklyn Shield Co., Brooklyn, N. Y.; Brooklyn Shield & Rubber Co., a New York corporation, assignee. Renewed April 12, 1922.

### Granted March 14, 1922, Act of February 20, 1905

153,100 MEDIC—waterproof fabric. Archer Strauss Rubber Co., Framingham, Mass.
153,144 PALL MALL—golf balls. Corona Rubber Manufacturing Co., Philadelphia, Pa.
153,151 STORM-KING—wind-shield cleaning devices. Doughty Manufacturing Co., New York, N. Y.
153,201 WHIZ—all-rubber patch adhesive outfit. The R. M. Hollingshead Co., Camden, N. J.
153,211 SWASTIKA SANITARY PRODUCTS in black-outlined white letters on arms of a swastika—sanitary rubber protectors, aprons, belts, sheeting, etc. Louis Jaffe, New York, N. Y.
153,237 METABOLAR—respiration-testing and gas-administration apparatus. E. I. McKesson, Toledo, O.
153,244 METALCRAFT on side of representation of conventionalized rubber-tired juvenile wagon—rubber-tired juvenile wagons. Metallic Industries, Inc., St. Louis, Mo.
153,263 BURLASBESTOS—woven fabric and asbestos sheeting for lining drykiln doors. The National Dry Kiln Co., Indianapolis, Ind.
153,290 RAYCO—brake lining. The Raybestos Co., Bridgeport, Conn.
153,332 The letters P. L. U., and S in the four angles formed by a Greek cross, within conventionalized tire—tires, tubes, reliners, and blowout patches. Times Square Auto Supply Co., Inc., New York, N. Y.
153,341 'ROYAL CORD'—insulated wire cable. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.
153,356 RITETITE PATCH above representation of two elephants pulling on ends of a patch—repair patches for rubber goods. C. G. Wright, Philadelphia, Pa.

### Act of March 19, 1920, Section 1 (b)

153,369 "EVER READY" curved above representation of a bear, all within a double-outlined circle—dress shields. C. Benedict Manufacturing Co., San Francisco, Calif.
153,372 SAFETY with letters arranged vertically—fountain pens. M. Finstone, New York, N. Y.

## The Dominion of Canada

### Registered

30,406 FLUFFY and PUFF in combination—powder puffs. W. J. Anderson Manufacturing & Rubber Co., Limited, London, Ont.
30,416 QUALITY SKILL CRAFT and "TIS THE QUALITY BEHIND THE NAME THAT COUNTS"—raincoats. Punchard-Birrell Co., Toronto, Ont.
30,428 ADAMS SEN SEN—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.

30,439 SILVER KING—golf balls. India Rubber, Gutta Percha & Telegraph Works Co., Limited, 106 Cannon street, London, Eng.
30,453 TIME SAVER on the diagram of a clock—rubber repair puncture and blowout patches. Timesaver Patch Co., Cleveland, Ohio, U. S. A.
30,506 SPARK-C enclosed within an ellipse—ignition testers. Canadian Westinghouse Co., Limited, Hamilton, Ont.
30,548 KLAWGRIP—tires, tire protectors and accessories. Gilles Valiquette, Montreal, Que.
30,556 Representation of coil of peculiar shape and construction—brake lining and clutch facing. The Raybestos Co., Bridgeport, Conn., U. S. A.
30,622 Representation of ball and wing—sporting goods. Wright & Ditson of Canada, Limited, Toronto, Ont.
30,624 COAST—tires. Coast Tire & Rubber Co., Oakland, Calif., U. S. A.

## The United Kingdom

### Published March 1, 1922

419,547 CARDI—raincoats and waterproof garments, etc. R. H. Green trading as The United Welsh Mills, 19 The Hayes, Cardiff.
421,460 ELAND and representation of the head of an eland—footballs, sporting goods, etc. Lugard & Pulham, 3 Featherstone Buildings, Holborn, London, W.C.1.

### Published March 8, 1922

419,673 Representation of grotesque figure having a conventionalized golf ball for a head—golf balls. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany street, Regent's Park, London, N.W.1.
419,674 Representation of grotesque figure having a conventionalized golf ball for a head—golf balls. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany street, Regent's Park, London N.W.1.
420,146 OVAL-OCTO—stocking and sock suspenders, garters, braces, belts, garment supporters, etc. Faire Bros. & Co., Limited, 2 Southampton street, and St. George's Mills, Leicester.
420,892 ULTRAMAC—waterproof and rainproof coats. J. Lipsitz, 15 Picadilly, Manchester.
421,198 VOLUNTEER—tubular hose. John Birch & Co., Limited, 2 London Wall Buildings, London Wall, London, E.C.2.
321,223 ARISTOCRAT—waterproof garments. Bank Bridge Works, Limited, 37 Fenchurch street, London, E.C.3.
421,531 VALKENIER—goods manufactured from rubber and gutta percha not included in classes other than No. 40. Naamlooze Vennootschap Vereenigde Nederlandsche Rubber Fabrieken, Dunolaan 162a, Heveadrop, Holland; address for service in the United Kingdom, care of Dicker & Pollak, 20-23 Holborn, London, E.C.1.
422,208 Representation of a classical warrior—rubber pads for boots and shoes. Blakey's Boot Protectors, Limited, Armley Malleable Ironworks, Modder Place, Armley, Leeds.
422,209 Representation of a female classical warrior—rubber pads for boots and shoes. Blakey's Boot Protectors, Limited, Armley Malleable Ironworks, Modder Place, Armley, Leeds.

# Designs

## The United States

### Patented February 7, 1922

60,389* Tire tread. Term 3½ years. F. V. Winters, New York, N. Y.

*Omitted from THE INDIA RUBBER WORLD, April 1, 1922.

### Patented March 7, 1922

60,512 Tire. Term 3½ years. A. L. Breitenstein, Akron, O.
60,517 Tire tread. Term 7 years. J. P. Drish, assignor by mesne assignments to Chicago City Rubber Works—both of Chicago, Ill.
60,518 Tire tread. Term 7 years. J. P. Drish, assignor by mesne assignments to Chicago City Rubber Works—both of Chicago, Ill.
60,523 Tire tread. Term 14 years. A. Faure, New York, N. Y.
60,524 Footwear (sole and heel). Term 3½ years. J. F. Gaken, Dunkirk, N. Y.
60,553 Balloon toy. Term 3½ years. H. A. Loomis, San Jose, Calif.
60,554 Balloon toy. Term 3½ years. H. A. Loomis, San Jose, Calif.

### Patented March 14, 1922

60,596 Tire tread. Term 3½ years. W. N. Allan, San Antonio, Tex.
60,607 Heel. Term 14 years. F. G. Delbon, Brooklyn, N. Y.
60,609 Tire. Term 14 years. F. J. Dougherty, Milwaukee, Wis., assignor by mesne assignments to The Fisk Rubber Co., Chicopee Falls, Mass.
60,620 Tire. Term 14 years. G. L. Mather, Milwaukee, Wis., assignor by mesne assignments to The Fisk Rubber Co., Chicopee Falls, Mass.
60,630 Tire. Term 14 years. B. H. Pratt, Milwaukee, Wis., assignor by mesne assignments to The Fisk Rubber Co., Chicopee Falls, Mass.
60,631 Tire tread. Term 7 years. H. D. Reichard, Akron, O.
60,632 Package for rubber bottle-nipples and soothers. Term 3½ years. J. D. Richards, Toronto, Ont., Can.

### Patented March 21, 1922

60,656 Tire. Term 7 years. J. B. Gabeline, Burlington, assignor to Standard Four Tire Co., Keokuk—both in Ia.
60,692 Tire. Term 3½ years. M. A. Marquette, Chicopee Falls, Mass.
60,702 Bicycle handle-bar grip. Term 7 years. T. R. Palmer, Erie, Pa.
60,704 Tire tread. Term 7 years. W. F. Ridge, Akron, O.
60,705 Tire tread. Term 3½ years. F. Rufenacht, Bucyrus, O.
60,709 Tire. Term 3½ years. R. S. Trogner, Akron, O.

### Patented March 28, 1922

60,722 Tire. Term 7 years. A. A. Glidden, Watertown, and E. O. Fritch, Belmont, assignors to Hood Rubber Co., Watertown—both in Mass.
60,723 Tire. Term 7 years. A. A. Glidden, Watertown, and E. O. Fritch, Belmont, assignors to Hood Rubber Co., Watertown—both in Mass.
60,724 Tire tread. Term 14 years. E. A. Hecht, Mansfield, O.
60,732 Tire. Term 7 years. R. Muir, assignor to Hood Rubber Co.—both of Watertown, Mass.

## The Dominion of Canada

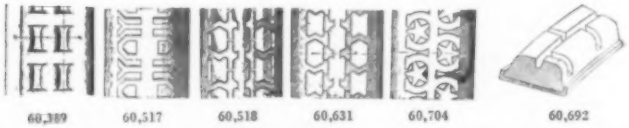
### Registered

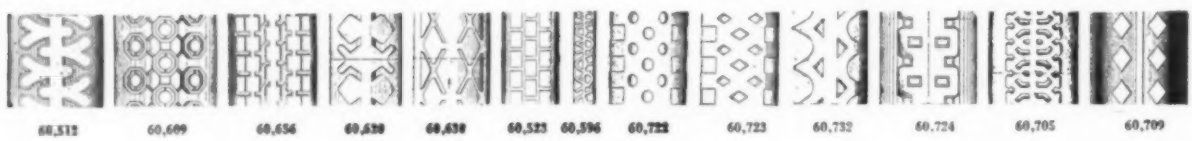
5,332 Tire. Patented February 17, 1922. The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ont.
5,333 Tire. Patented February 17, 1922. The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ont.
5,334 Tire tread. Patented February 17, 1922. The Oak Tire & Rubber Co., Limited, Toronto, Ont.
5,335 Tire tread. Patented February 17, 1922. The Oak Tire & Rubber Co., Limited, Toronto, Ont.
5,344 Ignition tester. Patented February 25, 1922. Canadian Westinghouse Co., Limited, Hamilton, Ont.
5,347 Rubber dental or barber chair mat. Patented February 27, 1922. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont.
5,348 Circular rubber mat. Patented February 27, 1922. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont.
5,354 Tire tread. Patented March 7, 1922. H. H. Hastings, Toronto, Ont.

## Germany

### Design Patents Issued, with Dates of Issue

806,432 (January 20, 1922) Ladder foot with adjusable cover, to be had with point for rough surfaces or rubber non-slipping device for smooth surfaces. Eggehard Schauffele, Sandhofer Strasse, Mannheim-Waldhof.
806,668 (January 6, 1922) Rubber sole. Hermann Oergel, Rebergstrasse 4, Hanover.
806,738 (January 19, 1922) Waterproof rupture band. Dr. Carl Ludwig Wörner, Schwanthalerstrasse 36, Münich.
806,764 (May 10, 1921) Binder. Julie Önnen, nee Fröschle, Falkertstrasse 42, Stuttgart.
807,000 (December 4, 1921) Repair band for all kinds of pneumatic tires. H. Roth, Basel represented by Georg Linsmayer, Wittlesbacherstrasse 4, Münich.
807,201 (January 26, 1922) Rupture band with device for electric treatment. Dr. Carl Ludwig Wörner, Schwanthalerstrasse 36, Münich.
807,252 (January 10, 1922) Elastic tires for bicycles, motorcycles, automobiles and airplanes. A. Theis, Dudelingen.
807,325 (May 17, 1921) Delousing cap. Continental Caoutchouc-und Gutta-Percha-Compagnie, Hanover.
807,356 (January 30, 1922) Rubber sole. Santo, G. m. b. H., Berlin.
807,423 (January 11, 1922) Tread for bicycle tires, protectors and the like, with diagonal raised parts and semicircular, intersecting ribs which are connected in the center by a thicker rib. Otto Eisele, Königstrasse 71-72, Halle, Saxony.
807,531 (January 31, 1922) Elastic, wooden bicycle handle with rubber cover. Albert Mattner, Neuestrasse 4, Kotzschenbroda-Dresden.
807,698 (February 8, 1922) Rustproof protective cover for wheel felloes with rubber tire. Hans Frederik Nielsen, Gundsolille, Denmark; represented by Th. Hauske, Brandenburgerstrasse 63, Berlin.
807,764 (February 4, 1922) Rubber sole or the like. Heinrich Mergen, Hilden.
807,765 (February 4, 1922) Tread patch of rubber or the like. Heinrich Mergen, Hilden.
807,804 (November 10, 1920) Shoe heel with interchangeable rubber patch attached by screws. Rudolf Westerhaus, Oberntorwall 30, Bielefeld.
807,817 (December 20, 1921) Rubber sole and heel lining. Richard Naujoks, Lenbachstrasse 21, Berlin-Lichtenberg.
807,842 (February 8, 1922) Interchangeable rubber heel. Carl Müller, Kaiserstrasse 64, M. Gladbach.
807,845 (February 9, 1922) Rubber sole in two parts. Carl Müller, Kaiserstrasse 64, M. Gladbach.
808,015 (January 16, 1922) Garment protector without fabric cover. Gummiwarenfabrik M. Steinberg, Köln-Lindenthal.
808,017 (January 16, 1922) Rubber sole. Gebruder Ullrich, Frankfort-on-the-Main.
808,024 (January 27, 1922) Solid rubber suspenders with or without fabric pattern in various colors. Matthias Braun, Hans-Sachsstrasse 44, Köln-Lindenthal.



# A Dutch View of the Crude Rubber Position

Artificial crop restriction, although never adopted in the Netherlands Indies, is now being advocated there, and in the *Netherlands Indies Rubber Journal* of December 1, C. F. Bodde, a well-known Java expert, points out several neglected factors and draws some interesting conclusions.

## A Fixed Average Yield per Acre Misleading

In handling the present situation he asserts that the near and more distant future must also be considered, and that in making production estimates one must not be misled into adopting a hard and fast fixed average of 320 pounds per acre as the average yield of trees varying in age from five to fifteen years. By a detailed computation of the annual productivity of each year's rubber plantings from 1905 up to date, he shows that after the twelfth year there is a decreasing productivity per acre, now generally noticed on plantations, that he believes has never before been taken into account by experts in their future estimates. On this basis average yields per acre are estimated as follows:

| Age Years | Yield Per Acre Pounds | Age Years | Yield Per Acre Pounds |
|---|---|---|---|
| 5 | 100 | 10 | 375 |
| 6 | 180 | 11 | 400 |
| 7 | 260 | 12 | 400 |
| 8 | 300 | 13 | 320 |
| 9 | 335 | 14 and older | 270 |

## Planted Acreage Less Productive Than Supposed

From the foregoing it would appear that the total world's planted acreage under rubber is considerably less productive than most published estimates would indicate. On the basis of yields indicated above, the world's production of plantation rubber for the years 1917 to 1926 is estimated as shown by the following table, the totals for the years 1917 to 1920 inclusive tallying remarkably well with the actual crop.

| Year | Estimated Production Tons | Actual Crop Tons |
|---|---|---|
| 1917 | 213,831 | 213,070 |
| 1918 | 254,640 | 254,450 |
| 1919 | 286,592 | 286,725 |
| 1920 | *304,856 | 304,816 |
| 1921 | 337,642 | ..... |
| 1922 | 360,010 | ..... |
| 1923 | 376,406 | ..... |
| 1924 | 384,218 | ..... |
| 1925 | 389,214 | ..... |
| 1926 | 393,520 | ..... |

*After 2½ per cent deduction for 25 per cent R. G. A. crop restriction after September.

## Future World Production

Mr. Bodde estimates the future total world crops under normal conditions and without restriction as follows:

| Year | Plantation Rubber Tons | Wild Rubber Tons | World's Production Tons |
|---|---|---|---|
| 1921 | 337,500 | 25,000 | 362,500 |
| 1922 | 360,000 | 20,000 | 380,000 |
| 1923 | 375,500 | 18,000 | 394,500 |
| 1924 | 384,000 | 15,000 | 399,000 |
| 1925 | 389,000 | 15,000 | 404,000 |
| 1926 | 393,500 | 20,000 | 413,500 |

## The World's Future Requirements

As in the six years from 1914 to 1920 the world's consumption increased four-fold, a future annual increase of 25,000 tons—under 10 per cent—can reasonably be expected, especially as the present price level brings rubber within the reach of industries which until now have been restricted to raw materials of lower quality. On this basis the world's future crude rubber requirements are estimated as follows:

| Year | Tons | Year | Tons |
|---|---|---|---|
| 1921 | 300,000 | 1924 | 375,000 |
| 1922 | 325,000 | 1925 | 400,000 |
| 1923 | 350,000 | 1926 | 425,000 |

## Production and Consumption Estimates Compared

Comparing the estimated production and consumption for the next four years, as shown by the accompanying table, indicates an overproduction of 127,500 tons, to which may be added the surplus of 73,000 tons* at the end of 1921, making a total surplus of some 200,000 tons at the end of 1925.

| Year | Production Tons | Consumption Tons |
|---|---|---|
| 1922 | 380,000 | 325,000 |
| 1923 | 394,500 | 350,000 |
| 1924 | 399,000 | 375,000 |
| 1925 | 404,000 | 400,000 |
| | 1,577,500 | 1,450,000 |

## Summary

The present situation, without crop restriction until 1926, would steadily become more critical. Planted acreage would remain approximately the same, and the world's crops would remain at something below 400,000 tons per annum. Improvement could thus be expected only from an overconsumption above 400,000 tons per annum. Assuming an increase in consumption of 25,000 tons per year, it would take until the middle of 1929 before the surplus of 200,000 tons at the end of 1925 would be worked off. After that would come a sudden and very critical change, as consumption in that year would exceed production by not less than 100,000 tons.

## Conclusions

From this summary Mr. Bodde concludes that the present planted acreage is not too great for the future need of rubber, but that extensions were made too rapidly for the regular increase in consumption to keep pace. A temporary crop restriction is therefore not patch-work to keep weak producers artificially on their legs, but a prudent method of regulating the temporarily disturbed balance between supply and demand, in favor of the producers now and of the consumers later on.

If it were possible to persuade the members of the Rubber Growers' Association and the International Association of Rubber Cultivation in the Netherland Indies to restrict their crops 25 per cent for the next two years, he asserts that the near future would have the following aspect:

| | Tons | Tons |
|---|---|---|
| Surplus at the end of 1921 | ..... | 73,000 |
| Estimated production, 1922 | 380,000 | ..... |
| 25% restriction of plantation rubber | 90,000 | 290,000 |
| | | 363,000 |
| Estimated consumption, 1922 | ..... | 325,000 |
| Surplus at the end of 1922 | ..... | 38,000 |
| Estimated production, 1923 | 394,500 | ..... |
| 25% restriction of plantation rubber | 94,125 | 300,375 |
| | | 338,375 |
| Estimated consumption, 1923 | ..... | 350,000 |
| Estimated *shortage* at the end of 1923 | ..... | 11,625 |

A decrease of about 50 per cent in the surplus in one year would certainly not take place without a very distinct effect on the course of prices, probably even a long time before the favorable turn in the statistical position became an established fact, the more so as a coming shortage would begin to cast its prospective shadow, or rather its light, far ahead.

*Estimate of Harrisons & Crosfield, Limited, London, England.

## USE OF MOTORCYCLES IN FRANCE INCREASING

Some official figures regarding the automotive industry in France have been lately received by the Bankers Trust Co., New York, N. Y. According to these statistics France had a registry of 237,125 automobiles and 50,783 motor cycles in 1920. The following is the total registration of vehicles: Cycles, 4,308,129; automobiles, 237,125; motorcycles, 50,783; sidecars, 5,559; cyclecars, 814; motor boats, 618.

Of the 237,125 automobiles registered, 79,076 were commercial vehicles and 158,049 were touring cars. It is interesting to note that the use of motor cycles in France has, during the year mentioned, increased very rapidly, 37,761 being in use in 1914, and only 28,538 in 1919.

# Review of the Crude Rubber Market

## New York

WITH the opening of April the dullness that characterized the market for several weeks previous showed indications of passing. Spot prices stiffened and rose 1/4 cent, futures advanced and factory buying interest was manifest, particularly by the large tire companies. The market assumed a firm tone, although transactions were small in volume. An advance recorded in the Singapore cables reacted favorably on the New York situation. Buyers were not inclined to meet the advance in price, sellers were few, and consumers' interest subsided appreciably. Within a week bids were within 1/4-cent a pound of sellers' views and less spot stock was being offered. At the present time New York spot stocks are believed to be the largest in history and controlled by very strong interests.

Before the middle of the month the price advance amounted to 2 cents a pound. The activity of the market was distinctly limited.

Prices for ribs and first latex held consistently above the 16-cent level, once having reached it previous to the Easter holidays. The course of the London market, where some weakness developed, tended to reduce activity in New York. Here, despite the dullness in trading, an upward tendency of price was noted and seasonal buying by the large tire manufacturing companies is counted upon to begin shortly.

Stocks are strongly held and bids of manufacturers do not meet dealers' views.

Importations of all grades during March were 73,198 tons, compared with 37,234 tons for March one year ago. Plantation arrivals for March were 22,358 tons compared with 14,416 tons for March one year ago.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. April 3. Spot, first latex crêpe, 14½-14¾ cents; April-June, 15-15¼ cents; July-September, 16-16½ cents; July-December, 16¾ cents. April 26. Spot, first latex crêpe, 16½ cents May-June, 16¾ cents; July-September, 17 cents; July-December, 18 cents.

April 3. Spot, ribbed smoked sheets, 14½-14¾ cents; April-June, 15-15¼ cents; July-September, 16-16¾ cents; July-December, 16¾ cents. April 26. Spot, ribbed smoked sheets, 16½ cents; May-June, 16¾ cents; July-September, 17 cents; July-December, 18 cents.

April 3. Spot, No. 1 amber crêpe, 14½ cents; April-June, 15 cents. April 26. Spot, No. 1 amber crêpe, 16 cents; May-June, 16¼ cents.

April 3. Spot, No. 1 rolled brown crêpe, 12½ cents; April-June, 13 cents. April 26. Spot, No. 1 rolled brown crêpe, 13 cents; May-June, 13½ cents

SOUTH AMERICAN PARÁS AND CAUCHO. April 3. Spot, upriver fine, 18½ cents; islands fine, 17 cents; upriver coarse, 13½ cents; islands coarse, 8½ cents; Cametá, 9½ cents; caucho ball, 12¾-13 cents. April 26. Spot, upriver fine, 19 cents; islands fine, 17½-18 cents; upriver coarse, 14 cents; islands coarse, 9½-10 cents; Cametá, 10 cents; caucho ball, 12-14 cents.

## London

The course of the London market during the past month has been one of mild activity only and steady prices, with inquiry mostly from American buyers, at 8*d*. to 8 1/8*d*. As the month progressed, minor fluctuations brought the price up to 9 1/2*d*. This level, however, was not maintained in the absence of trading on an important scale.

Later, the market was steady, 8 7/8*d*., being quoted on April 24, and exchange was $4.42 5/8, the highest it has been for two weeks or more.

This is equivalent to 16.65 cents per pound.

## New York Quotations

Following are the New York spot quotations, for one year and one month ago, and April 26, the current date:

| Plantation Hevea | May 1, 1921 | April 1, 1922 | April 26, 1922 |
|---|---|---|---|
| First latex crêpe | $0.19 @.19½ | $0.14½ @ | $0.16¾ @.16½ |
| Off latex crêpe | .18 @.18½ | .14 @ | .16 @ |
| Amber crêpe No. 1 | .15½ @ | .14 @.14½ | .16 @ |
| Amber crêpe No. 2 | .14½ @ | .13¾ @.14 | .15½ @ |
| Amber crêpe No. 3 | .13½ @ | .13½ @ | .15 @ |
| Brown crêpe thin | .15 @ | .13½ @ | .15 @ |
| Brown crêpe, specky | .13½ @ | .12 @.13 | .14½ @ |
| Brown crêpe, rolled | .12 @.12½ | .12½ @ | .13 @ |
| Smoked sheet, ribbed | .17 @.17½ | .14½ @ | .16¼ @.16½ |
| Smoked sheet, plain | .15½ @ | .14 @ | .15½ @ |
| Unsmoked sheet | .15½ @ | .14 @ | .15 @ |
| Colombo scrap No. 1 | .11½ @ | .12 @.12½ | .13½ @ |
| Colombo scrap No. 2 | .09½ @ | .10¾ @.11 | .11½ @ |
| **East Indian** | | | |
| PONTIANAK | | | |
| Banjermassin | .07 @ | .08 @ | .08 @ |
| Palembang | .09 @ | .10 @ | .09 @ |
| Pressed block | .12 @ | .13 @ | .13¼ @ |
| Sarawak | .06 @ | 06¼ @ | .06½ @ |
| **South American** | | | |
| PARAS | | | |
| Upriver, fine | .17½ @.18 | .17½ @.17¾ | .19 @ |
| Upriver, medium | .13½ @ | .16 @.17 | .17 @ |
| Upriver, coarse | .09½ @ | .13 @ | .14 @ |
| Upriver, weak, fine | @ | .15 @.16 | .16 @ |
| Islands, fine | .18 @ | .16¾ @.17 | .17½ @.18 |
| Islands, medium | .13½ @ | .15 @.15½ | |
| Islands, coarse | .12½ @ | .08 @.08½ | .09½ @.10 |
| Acre Bolivian, fine | .18 @ | .18 @ | .19¼ @.19½ |
| Beni Bolivian | @ | .18½ @.19 | .19½ @.20 |
| Cametá | .12½ @ | .09½ @ | .10 @ |
| Madeira, fine | .19½ @ | .19 @.20 | .20 @.21 |
| Peruvian, fine | .16½ @ | .16½ @.16¾ | .17 @.18 |
| Tapajos, fine | .15½ @ | 16 @.16¼ | .17 @ |
| PARAS—Washed and Dried (Shipment from Brazil) | | | |
| Acre Bolivian fine | @ | @ | .32 @ |
| Islands, fine | @ | @ | .31 @ |
| Upriver, fine | @ | @ | .32 @ |
| Upper caucho ball | @ | @ | .19 @ |
| Cametá | @ | @ | .21 @ |
| CAUCHO | | | |
| Upper caucho ball | .12¼ @ | .13 @ | .14 @ |
| Lower caucho ball | .11 @ | 11½ @ | .12 @ |
| **Maniçobas** | | | |
| Ceará negro heads | .10 @ | *.11 @ | *.10 @ |
| Ceará scrap | .06 @ | *.07 @ | *.09 @ |
| Maniçoba 30% guaranty | .11 @ | *.08½ @ | *.07 @ |
| Mangabeira thin sheet | .12 @ | *.14 @ | *.12 @ |
| **Centrals** | | | |
| Central scrap | .09 @.10 | .09 @.10½ | .08 @.09 |
| Central scrap and strip | .07 @.08 | .08 @.09 | .07 @.08 |
| Central wet sheet | .04 @.05 | .04 @.06 | .04 @.05 |
| Corinto scrap | .09 @.10 | .09 @.10½ | .08 @.09 |
| Esmeralda sausage | .09 @.10 | .09 @.10½ | .08 @.09 |
| Guayule, 20% guaranty | @ | @ | @ |
| Guayule washed and dried | .26 @ | 26 @ | .26 @ |
| **Africans** | | | |
| Benguela, No. 1, 28½% | *.08½ @ | .09 @ | *.08½ @ |
| Benguela, No. 2, 32½% | *.07½ @ | .07 @ | *.07 @ |
| Conakry niggers | *.16½ @ | .17 @ | *.16½ @ |
| Congo prime, black upper | *.14 @ | .14½ @ | .14 @ |
| Congo prime, red upper | *.13½ @ | .14 @ | .12¾ @ |
| Kassai, black | *.14 @ | .14 @ | *.13½ @ |
| red | *.11 @ | .10 @.12 | .12 @ |
| Massai sheets and strings | @ | .17 @ | *.16 @.17 |
| Niger flake, prime | .14 @ | .14½ @ | @ |
| Rio Nunez ball | @ | @ | @ |
| Rio Nunez sheets, strings | *.17½ @ | .17 @.18 | *.17½ @ |
| **Gutta Percha** | | | |
| Gutta Siak | .15 @.16 | .17¾ @.18 | .17½ @.18 |
| Red Macassar | 2.00 @2.75 | 3.00 @ | 2.85 @3.50 |
| **Balata** | | | |
| Block, Ciudad, Bolivar | .54 @.55 | .51 @ | .50 @.51 |
| Colombian | .45 @.46 | .46 @ | .40 @.42 |
| Panama | .45 @ | .45 @ | .35 @.40 |
| Surinam sheet | .70 @.71 | .67 @ | .64 @.66 |
| amber | .80 @ | .72 @ | .70 @.72 |

*Nominal.

## Reclaimed Rubber

The general revival of manufacturing operations in several of the divisions of the rubber industry together with the firmness and rising tendency of crude rubber prices, help to form an optimistic background for the rubber reclaimer. Reclaim is still of marked value in compounding and will continue to hold an important relation in rubber manufacturing practice.

Reclaiming plants generally are operating at 25 to 30 per cent of capacity on the better grades mostly. The business is on essentially the same basis as last fall with improvement in outlook not undiscernible. Prices have not changed since a month ago.

### New York Quotations

APRIL 27, 1922

Prices subject to change without notice

| | |
|---|---|
| **STANDARD RECLAIMS** | |
| Floating | $0.12 @ $0.13 |
| Friction | .12 @ .13 |
| Mechanical | .08 @ .10 |
| Shoe | .10¼ @ .10¾ |
| Tires, auto | .09 @ .10 |
| truck | .09 @ .10 |
| White | .13 @ .14 |

## Comparative Low and High New York Spot Rubber Prices

| | April 1922* | April 1921 | April 1920 |
|---|---|---|---|
| **PLANTATIONS** | | | |
| First latex crêpe | $0.14¾ @ $0.16¾ | $0.18¼ @ $0.19½ | $0.42½ @ $0.46½ |
| Smoked sheet, ribbed | .14¾ @ .16¾ | .16 @ .17¼ | .42½ @ .45 |
| **PARAS** | | | |
| Upriver, fine | .17¼ @ .19¾ | .16½ @ .18 | .40½ @ .42 |
| Upriver, coarse | .12 @ .14 | .09 @ .10½ | .30 @ .32 |
| Islands, fine | .16 @ .18¼ | .17 @ .18 | .41 @ .42 |
| Islands, coarse | .07½ @ .09¾ | .09½ @ .12 | .21½ @ |
| Cametá | .09 @ .10 | .08 @ .11 | .22½ @ |

*Figured to April 26, 1922.

## Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of April 7, 1922: The market suddenly emerged from the deadlock and the tone became firm with gradually advancing prices. In our market, however, remained a certain mistrust, buyers followed the advance only cautiously, and sellers availed themselves of every good bid. The turnover generally remained rather limited. There was a little more demand for sheets but hardly any supply. The close is firm at the highest prices of the week as follows:

Hevea crêpe, Fl. .46. Sheets, Fl. .46½ spot.
Hevea crêpe, Fl. .47. Sheets, Fl. .47½ April to June.
Hevea crêpe, Fl. .48½. Sheets, Fl. .49. July to September.
Hevea crêpe, Fl. .50½. Sheets, Fl. .51. October to December.

## Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, reports under date of March 16, 1922:

Since the last report, the local rubber market has been quietly steady, there being a consistent inquiry for near-by delivery, with sellers holding off. For the weekly auctions yesterday, 817 tons were forwarded for sale. All grades were in strong demand at slightly improved values on the week.

Standard sheet sold at 27 to 27¼ cents, an advance of 1½ cents. Good F. A. Q. sheet was in request at 26 to 26½ cents, while good prices were obtained for off lots of moldy sheet. Pale crêpes were again in good favor and all grades sold readily at a cent advance. Lower grade crêpes were in strong demand and shared in the upward tendency; 601 tons were sold. The following is the course of values:

| | In Singapore per Pound | Sterling Equivalent per Pound in London |
|---|---|---|
| Sheet, fine ribbed smoked | 27 @ 27½ | —/ 8½ @ —/ 8¾ |
| Sheet, good F. A. Q. | 26 @ 26½ | —/ 8¼ @ —/ 8⅜ |
| Sheet, off quality | 21 @ 25½ | —/ 6⅞ @ —/ 8⅛ |
| Crêpe, fine pale | 26½ | —/ 8⅜ |
| Crêpe, good pale | 25 @ 26 | —/ 8⅛ @ —/ 8¼ |
| Crêpe, off quality | 20 @ 24½ | —/ 7⅛ @ —/ 8¼ |
| Crêpe, fine brown | 23½ | —/ 8⅛ |
| Crêpe, good brown | 18½ @ 23 | —/ 6⅛ @ —/ 8 |
| Crêpe, dark | 16½ @ 22 | —/ 6⅛ @ —/ 7⅝ |
| Crêpe, bark | 16 @ 19 | —/ 6 @ —/ 6¾ |

## Plantation Rubber Exports from Malaya

(These figures include the production of the Federated Malay States, but not of Ceylon.)

| | January 1 to February 28, 1922 | | | January 1 to March 9, 1922 | |
|---|---|---|---|---|---|
| | Singapore | Malacca | Penang | Port Swettenham | Totals |
| To United Kingdom, *pounds* | 550,700 | 2,059,000 | 817,400 | 3,315,139 | 6,742,239 |
| The Continent | 2,356,100 | 100,900 | 478,900 | 119,120 | 3,055,020 |
| Japan | 6,772,400 | ..... | 56,000 | ..... | 6,828,400 |
| United States | 53,415,300 | 5,363,600 | 3,691,500 | 441,321 | 62,911,721 |
| British Possessions | 425,100 | ..... | ..... | 155,275 | 580,375 |
| Other countries | 38,300 | ..... | ..... | ..... | 38,300 |
| Totals, *pounds* | 63,557,900 | 7,523,500 | 5,043,800 | *4,030,855 | 80,156,055 |

### Annual Exports, 1914-1921

| Year | | | | | |
|---|---|---|---|---|---|
| 1921 | *pounds* 298,231,765 | 12,709,484 | 35,978,829 | 18,633,855 | 365,553,933 |
| 1920 | 374,718,987 | 4,508,453 | 45,022,557 | 26,306,225 | 450,556,222 |
| 1919 | 352,338,000 | 17,849,500 | 25,779,500 | 30,850,166 | 426,817,166 |
| 1918 | 225,100,000 | 837,600 | 12,479,200 | ..... | 238,416,800 |
| 1917 | 177,901,200 | 15,113,200 | 23,402,000 | ..... | 216,416,200 |
| 1916 | 135,535,954 | 7,167,346 | 30,643,565 | 3,660,840 | 177,007,705 |
| 1915 | 86,067,657 | 7,898,984 | 28,580,663 | 821,445 | 123,368,749 |
| 1914 | 43,534,177 | 5,218,379 | 21,912,567 | 2,052,620 | 72,717,743 |

*Not verified.

## British Malaya Rubber Exports

An official cablegram from Singapore states that 44,874,200 pounds of rubber (20,033 tons) were exported from British Malaya in the month of February, as against 42,474,800 pounds (18,962 tons) in January.

## New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

| | March, 1922 | | | | | | | | | | | April, 1922 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 21 | 22 | 23 | 24 | 25 | 27 | 28 | 29 | 30 | 31 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12 | 13 | 14 | 15 |
| **PLANTATIONS** | | | | | | | | | | | | | | | | | | | | | | | | |
| Sheet | | | | | | | | | | | | | | | | | | | | | | | | |
| Ribbed smoked | | | | | | | | | | | | | | | | | | | | | | | | |
| Crepe | 14½ | 14⅛ | 14⅝ | 14⅜ | 14⅜ | 14⅜ | 14⅜ | 14⅜ | 14⅜ | 14¼ | 14⅝ | 14⅝ | 14⅝ | 14⅞ | 15⅛ | 15⅜ | 16⅛ | 16⅛ | 16¼ | 15⅜ | 16 | 16⅜ | 16⅜ | 16⅜ |
| First latex | 14⅜ | 14⅛ | 14⅜ | 14⅜ | 14½ | 14½ | 14⅝ | 14⅜ | 14½ | 14½ | 14⅜ | 14⅜ | 14⅜ | 14⅞ | 15⅛ | 15⅜ | 16⅜ | 16⅛ | 16¼ | 15⅜ | 16 | 16⅜ | 16⅜ | 16⅛ |
| Off latex | 14¼ | 13⅞ | 14⅛ | 14¼ | 14¼ | 14¼ | 14¼ | 14½ | 14 | 14 | 14⅛ | 14⅛ | 14⅛ | 14¼ | 14¾ | 15½ | 15⅞ | 15⅞ | 16 | 15¼ | 15½ | 15⅞ | 15⅜ | 15⅞ |
| No. 1 blanket | 14⅛ | 14⅛ | 14⅜ | 14¼ | 14⅛ | 14⅛ | 14⅛ | 14⅛ | 14 | 14⅛ | 14⅜ | 14⅜ | 14½ | 14⅝ | 14⅝ | 15½ | 15½ | 15½ | 15⅝ | 15⅛ | 15½ | 15⅝ | 15⅝ | 15⅝ |
| No. 2 blanket | 13¾ | 13¾ | 13⅞ | 13⅞ | 13⅝ | 13⅝ | 13⅝ | 13⅝ | 13½ | 13⅝ | 13⅞ | 13⅞ | 13¾ | 14⅛ | 14⅜ | 14⅜ | 14⅜ | 14⅜ | 15¼ | 14⅝ | 14⅜ | 15⅛ | 15⅛ | 15⅛ |
| No. 3 blanket | 13⅛ | 13¼ | 13⅜ | 13⅜ | 13¼ | 13¼ | 13⅜ | 13⅜ | 13 | 13⅛ | 13⅜ | 13⅜ | 13¼ | 13⅝ | 14 | 14¼ | 14¼ | 14¼ | 14⅞ | 14¼ | 14⅛ | 14½ | 14½ | 14½ |
| Thin, clean, brown | 13¾ | 13 | 13¼ | 13⅜ | 13⅛ | 13⅛ | 13¼ | 13¼ | 13¼ | 13¼ | 13¾ | 13⅜ | 13½ | 13¾ | 13½ | 14⅛ | 14⅝ | 14⅝ | 15⅛ | 14¾ | 14¾ | 15⅛ | 15⅛ | 15⅛ |
| Specky brown | 12¾ | 12⅜ | 12⅝ | 12¾ | 12⅝ | 12⅝ | 12¾ | 12⅝ | 12¾ | 12¾ | 13⅛ | 13⅛ | 12¾ | 13¼ | 13½ | 13⅞ | 14¼ | 14¼ | 14¾ | 14⅛ | 14⅛ | 14⅝ | 14⅝ | 14⅝ |
| Rolled brown | 12¼ | 12¼ | 12⅜ | 12¼ | 12¼ | 12¼ | 12⅝ | 12½ | 12¼ | 12⅜ | 12⅜ | 12⅜ | 12¼ | 12⅝ | 12⅝ | 12¾ | 13¼ | 13¼ | 13¼ | 13¼ | 13⅜ | 13¼ | 13¼ | 13¼ |

## United States Crude and Waste Rubber Imports for 1922 (By Months)

| | | Plantations | Parás | Africans | Centrals | Guayule | Manicoba and Matto Grosso | Totals 1922 | Totals 1921 | Balata | Miscellaneous | Waste |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | *tons* | 20,774 | 916 | 161 | 16 | .... | .... | 21,867 | 14,177 | 42 | 126 | 85 |
| February | | 27,270 | 1,347 | 301 | 14 | .... | 41 | 28,973 | 8,839 | 28 | 448 | 6 |
| March | | 21,521 | 451 | 326 | 3 | .... | 57 | 22,358 | 14,416 | 17 | 479 | 61 |
| Totals, 3 months, 1922 | *tons* | 69,565 | 2,714 | 788 | 33 | .... | 98 | 73,198 | ..... | 87 | 1,053 | 152 |
| Totals, 3 months, 1921 | | 32,973 | 3,538 | 689 | 6 | 25 | 3 | ..... | 37,432 | 95 | 396 | 1,453 |

*Compiled by The Rubber Association of America, Inc.*

# Crude Rubber Arrivals at New York as Stated by Ships' Manifests

## Parás and Caucho

| | Fine | Medium | Coarse | Caucho | Total Pounds |
|---|---|---|---|---|---|
| MARCH 27. By "Hubert," Brazil. | | | | | |
| L. Littlejohn & Co., Inc. | ..... | ..... | ..... | ..... | 120,219 |
| Meyer & Brown, Inc. | ..... | ..... | ..... | ..... | *47,040 |
| MARCH 30. By "Michael," Pará. | | | | | |
| H. A. Astlett & Co. | ..... | ..... | ..... | 26,000 | 26,000 |
| Poel & Kelly, Inc. | ..... | ..... | ..... | 26,967 | 26,967 |
| L. Littlejohn & Co., Inc. | ..... | ..... | ..... | ..... | 42,102 |
| Ultramares Corporation | 85,738 | ..... | 2,437 | 12,813 | 100,988 |
| General Rubber Co. | ..... | ..... | ..... | 134,440 | 134,440 |
| APRIL 13. By "Justin," Manáos. | | | | | |
| General Rubber Co. | ..... | ..... | 56,000 | 13,440 | 69,440 |
| Paul Bertuch | ..... | ..... | 15,680 | ..... | 15,680 |
| L. Littlejohn & Co., Inc. | ..... | ..... | ..... | ..... | 58,240 |
| Meyer & Brown, Inc. | ..... | ..... | ..... | ..... | 17,920 |
| Poel & Kelly, Inc. | ..... | ..... | 44,800 | ..... | 44,800 |
| APRIL 14. By "Boswell," Pará | | | | | |
| H. A. Astlett & Co. | 11,200 | ..... | ..... | ..... | 11,200 |
| Various | 9,590 | 43,890 | 15,600 | ..... | 69,080 |

*Fine and medium.

## Plantations

*(Figured at 180 pounds net to the bale or case.)*

| | Pounds | Totals |
|---|---|---|
| MARCH 15. By "Creole State," Far East. | | |
| Fred Stern & Co. | [1]56,853 | |
| Poel & Kelly, Inc. | [1]113,200 | 170,053 |
| MARCH 22. By "Mesaba," London. | | |
| Michelin Tire Co. | 92,700 | |
| L. Littlejohn & Co., Inc. | 280,000 | |
| William H. Stiles & Co., Inc. | 22,400 | |
| Various | 360 | 395,460 |
| MARCH 22. By "Vardulia," London. | | |
| Fred Stern & Co. | 223,837 | |
| Various | 48,503 | 272,340 |
| MARCH 23. By "Roseric," Colombo. | | |
| L. Littlejohn & Co., Inc. | 275,280 | |
| General Rubber Co. | 459,200 | |
| Meyer & Brown, Inc. | 224,000 | |
| Charles T. Wilson Co., Inc. | 118,720 | |
| Fred Stern & Co. | 67,200 | 1,144,400 |
| MARCH 23. By "Sitoe Bendo," Far East. | | |
| L. Littlejohn & Co., Inc. | 414,400 | |
| H. Muehlstein & Co. | 68,400 | |
| Aldens' Successors, Inc. | 22,377 | |
| Meyer & Brown, Inc. | 56,000 | |
| Poel & Kelly, Inc. | 59,890 | |
| Fred Stern & Co. | 101,735 | |
| F. R. Henderson & Co., Inc. | 65,000 | |
| Various | 1,163,398 | 1,951,200 |
| MARCH 24. By "Oanfa," Far East. | | |
| Baird Rubber & Trading Co., Inc. | 106,400 | |
| Adolph Hirsch & Co., Inc. | 44,800 | |
| Hood Rubber Co. | 134,400 | |
| J. T. Johnstone & Co., Inc. | 204,512 | |
| L. Littlejohn & Co., Inc. | 1,415,680 | |
| William H. Stiles & Co., Inc. | 156,800 | |
| General Rubber Co. | 972,160 | |
| Meyer & Brown, Inc. | 392,000 | |
| Poel & Kelly, Inc. | 506,880 | |
| Fred Stern & Co. | 352,355 | |
| F. R. Henderson Co., Inc. | 466,530 | 4,752,517 |
| MARCH 24. By "City of Lucknow," Far East. | | |
| L. Littlejohn & Co., Inc. | 212,800 | |
| General Rubber Co. | 134,400 | |
| Poel & Kelly, Inc. | 132,960 | |
| Charles T. Wilson Co., Inc. | 248,640 | 728,800 |
| MARCH 25. By "Noordam," London. | | |
| L. LittleJohn & Co., Inc. | | 22,400 |
| MARCH 25. By "Montauk," London. | | |
| L. Littlejohn Co., Inc. | | 45,965 |
| MARCH 25. By "Inkum," London. | | |
| L. Littlejohn & Co., Inc. | 571,477 | |
| Poel & Kelly, Inc. | 22,419 | |
| Fred Stern & Co. | 268,927 | 862,823 |
| MARCH 27. By "Montana," London. | | |
| Continental Rubber Co. of New York | 22,400 | |
| Aldens' Successors, Inc. | 22,465 | |
| Various | 102,735 | 147,600 |
| MARCH 27. By "Egremont Castle." Far East. | | |
| American Trading Co. | 73,620 | |
| Firestone Tire & Rubber Co. | 403,200 | |
| Hood Rubber Co. | [2]118,222 | |
| C. B. Kaufman | 630,000 | |
| L. Littlejohn & Co., Inc. | 683,200 | |
| Fred Stern & Co. | 415,539 | |
| William H. Stiles & Co. | 11,200 | |
| H. Muehlstein & Co. | 88,740 | |
| Chas. T. Wilson Co., Inc. | 190,400 | |
| Baird Rubber & Trading Co., Inc. | 33,600 | |
| Joosten & Janssen | 33,600 | |
| J. T. Johnstone Co., Inc. | 123,200 | |
| Continental Rubber Co., of New York | 44,800 | |
| Aldens' Successors, Inc. | 44,556 | |
| General Rubber Co. | 993,760 | |
| Meyer & Brown, Inc. | 280,000 | |
| Mitsui & Co., Limited | 56,000 | |
| Poel & Kelly, Inc. | 513,059 | |
| F. R. Henderson & Co., Inc. | 383,300 | |
| Various | 1,379,364 | 6,499,360 |
| MARCH 29. By "Clan Kennedy," Algiers. | | |
| Hood Rubber Co. | 22,400 | |
| L. Littlejohn & Co., Inc. | 29,120 | |
| Poel & Kelly, Inc. | 500 | |
| Various | 34,200 | 86,220 |
| MARCH 30. By "Tsuyama Maru," Far East. | | |
| J. T. Johnstone & Co., Inc. | 49,280 | |
| L. Littlejohn & Co., Inc. | 56,000 | |
| William H. Stiles & Co. | 11,200 | |
| Meyer & Brown, Inc. | 44,800 | |
| Poel & Kelly, Inc. | 70,480 | |
| Fred Stern & Co. | 181,520 | |
| F. R. Henderson & Co., Inc. | 370,680 | |
| Various | 29,820 | 813,780 |
| MARCH 30. By "Virgilia," London. | | |
| L. Littlejohn & Co., Inc. | | 123,200 |
| MARCH 30. By "City of Cambridge." Far East. | | |
| American Trading Co. | 309,240 | |
| Baring Bros. | 71,640 | |
| Thomas A. Desmond Co. | 20,160 | |
| Firestone Tire & Rubber Co. | 310,320 | |
| General Rubber Co. | 591,000 | |
| Hood Rubber Co. | [2]112,100 | |
| L. Littlejohn & Co. | 1,340,000 | |
| A. Latham Co. | 100,800 | |
| Meyer & Brown, Inc. | 224,000 | |
| H. Muehlstein & Co. | 169,920 | |
| Pell & Dumont | 46,620 | |
| Poel & Kelly, Inc. | [2]547,509 | |
| Rubber Importers & Dealers Co., Inc. | 120,960 | |
| William H. Stiles & Co. | 150,080 | |
| Fred Stern & Co. | 129,935 | |
| Baird Rubber & Trading Co., Inc. | 100,800 | |
| J. T. Johnstone & Co., Inc. | 233,080 | |
| Continental Rubber Co. of New York | 22,400 | |
| H. A. Astlett & Co. | 402,000 | |
| Charles T. Wilson Co., Inc. | 156,800 | |
| F. R. Henderson & Co., Inc. | 56,000 | |
| Various | 2,589,256 | 7,804,620 |
| MARCH 31. By "Moorish Prince," Singapore. | | |
| Baring Bros. | 252,000 | |
| Nat E. Berzen | 43,200 | |
| Thos. A. Desmond & Co. | 163,440 | |
| Firestone Tire & Rubber Co. | 310,320 | |
| General Rubber Co. | 224,000 | |
| L. Littlejohn & Co., Inc. | 828,560 | |
| Meyer & Brown, Inc. | 112,000 | |
| H. Muehlstein & Co. | 336,960 | |
| Edward Maurer Co., Inc. | 77,220 | |
| Poel & Kelly, Inc. | 379,840 | |
| Rubber Trading Co. | 30,240 | |
| William H. Stiles & Co. | 201,600 | |
| Vernon Metal Produce Co. | 18,180 | |
| Chas. T. Wilson Co., Inc. | 145,600 | |
| B. Williamson Co. | 230,040 | |
| Baird Rubber & Trading Co., Inc. | 168,000 | |
| Hood Rubber Co. | 112,000 | |
| H. A. Astlett & Co. | 56,000 | |
| Fred Stern & Co. | 130,079 | |
| F. R. Henderson & Co., Inc. | 118,900 | |
| Various | 108,221 | 4,046,400 |
| APRIL 1. By "Menominee," London. | | |
| L. Littlejohn & Co., Inc. | 336,379 | |
| Various | 69,341 | 405,720 |
| APRIL 2. By "Romeo," Colombo. | | |
| Continental Rubber Co. | 78,400 | |
| Hood Rubber Co. | [2]78,460 | |
| H. A. Astlett Co. | 67,200 | |
| Meyer & Brown, Inc. | 145,600 | |
| Poel & Kelly, Inc. | 26,880 | |
| Charles T. Wilson Co., Inc. | 33,600 | |
| L. Littlejohn & Co., Inc. | 212,800 | |
| Irwin-Harrisons Crosfield, Inc. | 195,840 | |
| Various | 35,300 | 874,080 |
| APRIL 3. By "Hague Maru," Far East. | | |
| L. Littlejohn & Co., Inc. | 526,400 | |
| William H. Stiles & Co. | 44,800 | |
| Poel & Kelly, Inc. | 845,320 | |
| Fred Stern & Co. | 56,100 | |
| F. R. Henderson & Co., Inc. | 68,000 | 1,540,620 |
| APRIL 3. By "Ixion," Far East. | | |
| Fred Stern & Co. | | [3]89,760 |
| APRIL 7. By "City of Durham," Far East. | | |
| Aldens' Successors, Inc. | 11,241 | |
| H. A. Astlett & Co. | 313,600 | |
| Baird Rubber & Trading Co., Inc. | 112,000 | |
| General Rubber Co. | 808,660 | |
| The Goodyear Tire & Rubber Co. | 102,240 | |
| Hood Rubber Co. | 67,300 | |
| J. T. Johnstone & Co., Inc. | 73,920 | |
| L. L. Littlejohn & Co., Inc. | 1,120,000 | |
| Meyer & Brown, Inc. | 235,200 | |
| Fred Stern & Co. | 219,520 | |
| Poel & Kelly, Inc. | 275,530 | |
| William H. Stiles & Co., Inc. | 78,400 | |
| Continental Rubber Co., of New York | 89,600 | |
| Charles T. Wilson Co., Inc. | 156,800 | |
| Various | 1,229,289 | 4,893,300 |
| APRIL 9. By "Doric Star," Far East. | | |
| American Trading Co. | 108,900 | |
| Poel & Kelly, Inc. | 247,619 | |
| Chas. T. Wilson Co., Inc. | 67,200 | |
| Baird Rubber & Trading Co., Inc. | 11,200 | |
| L. Littlejohn & Co., Inc. | 672,000 | |
| General Rubber Co. | 224,000 | |
| Fred Stern & Co. | 13,440 | |
| Various | 196,981 | 1,541,340 |
| APRIL 10. By "City of Westminster," Colombo. | | |
| The Goodyear Tire & Rubber Co. | 81,000 | |
| Hood Rubber Co. | [2]22,400 | |
| Adolph Hirsch | 44,800 | |
| L. Littlejohn & Co., Inc. | 49,200 | |
| William H. Stiles & Co. | 11,200 | |
| General Rubber Co. | 481,600 | |
| Charles T. Wilson Co., Inc. | 33,600 | |
| Fred Stern & Co. | 33,640 | |
| F. R. Henderson & Co., Inc. | 33,600 | |
| Various | 324,600 | 1,115,640 |
| APRIL 10. By "Port Augusta," London. | | |
| Fred Stern & Co. | 22,465 | |
| Various | 272,015 | 294,480 |
| APRIL 10. By "Maine," London. | | |
| L. Littlejohn & Co., Inc. | | 560,000 |
| APRIL 12. "City of Valencia," London. | | |
| Hood Rubber Co. | 56,000 | |
| L. Littlejohn & Co., Inc. | 145,600 | 201,600 |
| APRIL 15. By "Minian," London. | | |
| Michelin Tire Co. | | 116,820 |

[1]Arrived at San Francisco.

[2]Arrived at Boston.

[3]Arrived at Seattle.

## Pontianak

| | Pounds | Totals |
|---|---|---|
| MARCH 23. By "Sitoe Bondo," Far East. | | |
| Baring Bros. | 126,000 | |
| L. Littlejohn & Co., Inc. | 28,800 | |
| Various | 322,800 | 477,600 |
| MARCH 27. By "Egremont Castle," Far East. | | |
| Various | | 87,900 |
| MARCH 30. By "City of Cambridge," Far East. | | |
| Far East Importing Co. | 38,400 | |
| Fred Stern & Co. | 35,043 | |
| Various | 123,657 | 197,100 |
| MARCH 31. By "Moorish Prince," Far East. | | |
| Various | | 34,800 |
| APRIL 7. By "City of Durham," Far East. | | |
| Various | | 24,600 |
| APRIL 9. By "Doric Star," Far East. | | |
| Various | | 111,600 |

## Guayule

| | Pounds | Totals |
|---|---|---|
| MARCH 21. By "El Alba, 318," Mexico. | | |
| Continental Mexican Rubber Co. | | 52,000 |
| MARCH 28. By "El Mundo 156," Mexico. | | |
| Continental Mexican Rubber Co. | | 83,900 |
| APRIL 5. By "El Alba 319," Mexico. | | |
| Continental-Mexican Rubber Co. | | 87,000 |
| APRIL 18. By "El Mundo, 157," Mexico. | | |
| Continental-Mexican Rubber Co. | | 69,000 |

## Centrals

| | Pounds | Totals |
|---|---|---|
| APRIL 7. By "Almagro," Guayaquil. | | |
| Various | | 600 |

## Africans

| | Pounds | Totals |
|---|---|---|
| APRIL 17. By "La Touraine," Havre. | | |
| Various | | 115 |

## Gutta Siak

| | Pounds | Totals |
|---|---|---|
| APRIL 7. By "City of Durham," Far East. | | |
| Various | | 16,800 |

## Gutta Percha

| | Pounds | Totals |
|---|---|---|
| APRIL 17. By "Ikala," London. | | |
| Various | | 300 |

## Balata

| | Pounds | Totals |
|---|---|---|
| MARCH 23. By "Paria," Paramaribo. | | |
| Middleton & Co., Limited | | 1,050 |
| MARCH 28. By "Bridgetown," Cartagena. | | |
| Various | | 1,610 |
| MARCH 29. By "Fort St. George," Trinidad. | | |
| Ultramares Corporation | | 23,544 |
| MARCH 30. By "Michael," Pará. | | |
| General Rubber Co. | 115 | |
| W. R. Grace & Co. | 115 | |
| Ultramares Corporation | 3,238 | 3,468 |
| MARCH 31. By "Mayaro," Trinidad. | | |
| Boos & Co. | 16,200 | |
| South & Central America Commercial Co. | 9,900 | 26,100 |
| MARCH 31. By "Sixaola," Cristobal. | | |
| G. Amsinck & Co., Inc. | | 1,800 |
| APRIL 7. By "Almagro," Guayaquil. | | |
| Various | | 750 |
| APRIL 10. By "Gen. G. W. Goethals," Cristobal. | | |
| G. Amsinck & Co., Inc. | 3,000 | |
| Various | 3,900 | 6,900 |

# Custom House Statistics

## New York

### Imports

| | February 1921 Pounds | February 1921 Value | February 1922 Pounds | February 1922 Value |
|---|---|---|---|---|
| UNMANUFACTURED—*free* | | | | |
| Crude Rubber | | | | |
| From Belgium | ..... | ..... | 170,840 | $11,282 |
| France | ..... | ..... | 185,800 | 5,574 |
| Netherlands | 360,640 | $74,928 | 242,130 | 43,876 |
| Portugal | ..... | ..... | 555,962 | 23,690 |
| England | 66,981 | 11,303 | 14,184,038 | 2,736,770 |
| Nicaragua | ..... | ..... | 3,243 | 324 |
| Cuba | ..... | ..... | 20,750 | 1,576 |
| Dominican Republic | ..... | ..... | 51,576 | 11,522 |
| Brazil | 1,147,121 | 210,290 | 2,782,351 | 354,257 |
| Chile | ..... | ..... | 2,725 | 444 |
| Colombia | 3,673 | 877 | 31,360 | 5,836 |
| Ecuador | 954 | 143 | 25,066 | 3,988 |
| British Guiana | ..... | ..... | 4,691 | 2,718 |
| Uruguay | ..... | ..... | 15,930 | 3,481 |
| British India | 166,791 | 51,073 | 266,156 | 39,542 |
| Ceylon | ..... | ..... | 6,179,341 | 1,116,016 |
| Straits Settlements | 13,788,173 | 4,891,002 | 32,266,407 | 4,946,422 |
| China | 29,135 | 10,197 | 22,400 | 2,876 |
| Java | ..... | ..... | 2,537,913 | 394,354 |
| Other Dutch E. I. | ..... | ..... | 5,427,178 | 902,539 |
| Far Eastern Republic | ..... | ..... | 551,450 | 38,637 |
| Honckong | ..... | ..... | 145,840 | 11,068 |
| Philippine Islands | ..... | ..... | 27,300 | 4,093 |
| Guatemala | 484 | 121 | ..... | ..... |
| Panama | 375 | 75 | ..... | ..... |
| Trinidad | 25 | 5 | ..... | ..... |
| British East Indies | 2,786,670 | 457,243 | ..... | ..... |
| Dutch East Indies | 3,169,471 | 1,037,256 | ..... | ..... |
| Costa Rica | 750 | 188 | ..... | ..... |
| Dutch Guiana | 23,505 | 11,737 | ..... | ..... |
| Totals | 21,544,748 | $6,756,438 | 65,700,447 | $10,660,885 |
| Balata | 187,356 | $114,432 | 145,925 | $75,920 |
| Jelutong (Pontianak) | 367,592 | 47,816 | 163,804 | 13,308 |
| Gutta percha | 251,611 | 42,406 | 68,800 | 12,241 |
| Totals | 22,351,307 | $6,961,092 | 66,078,976 | $10,762,354 |
| Rubber scrap and reclaimed | 215,310 | $11,826 | 618,609 | $10,772 |
| Totals, unmanufactured | 22,566,617 | $6,972,918 | 66,697,585 | $10,773,126 |
| Manufactures of rubber and gutta percha *dutiable* | ..... | $47,761 | ..... | $103,719 |
| Chicle *dutiable* | 212,954 | 109,350 | 565,071 | 295,939 |
| Rubber substitutes *dutiable* | 706 | 250 | 896 | 120 |

### Exports

| | February 1921 Pounds | February 1921 Value | February 1922 Pounds | February 1922 Value |
|---|---|---|---|---|
| MANUFACTURED | | | | |
| Automobile and other tires | ..... | $1,055,937 | ..... | $132,670 |
| Inner tubes | ..... | 93,467 | ..... | 66,068 |
| Belting, hose, and packing | ..... | 456,672 | ..... | 111,324 |
| Rubber boots and shoes, *pairs* | 161,616 | 204,382 | 25,988 | 51,075 |
| Soles and heels | ..... | 55,087 | ..... | 24,218 |
| Druggists' sundries | ..... | 81,421 | ..... | 57,668 |
| Other rubber manufactures | ..... | 369,491 | ..... | 311,732 |
| Totals, manufactured | ..... | $2,316,457 | ..... | $754,745 |
| Insulated wire | ..... | $1,046,512 | ..... | $92,162 |

| | February 1921 Pounds | February 1921 Value | February 1922 Pounds | February 1922 Value |
|---|---|---|---|---|
| UNMANUFACTURED—*free* | | | | |
| Rubber scrap and reclaimed | 582,364 | $42,118 | 458,898 | $19,920 |

### Foreign Exports

| | February 1921 Pounds | February 1921 Value | February 1922 Pounds | February 1922 Value |
|---|---|---|---|---|
| Crude rubber | $1,359 | $7,079 | 7,280 | $1,470 |
| Balata | 82,163 | $29,391 | 67,569 | 38,751 |
| Rubber manufactures | ..... | 12,049 | ..... | 1,522 |

## STATEMENT OF THE INDIA RUBBER WORLD

Statement of the ownership, management, etc., required by the Act of Congress of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for April 1, 1922.

State of New York, } ss.:
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared E. M. Hoag, who having been duly sworn according to law, deposes and says that she is the business manager of THE INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, The India Rubber Publishing Co., 25 West Forty-fifth Street, New York City.

Editor, Henry C. Pearson, 25 West Forty-fifth Street, New York City.

Managing Editor, Henry C. Pearson, 25 West Forty-fifth Street, New York City.

Business Manager, E. M. Hoag, 25 West Forty-fifth Street, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.

The India Rubber Publishing Co., 25 West Forty-fifth Street, New York City.

Henry C. Pearson, 25 West Forty-fifth Street, New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which the stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. HOAG, Business Manager.

Sworn to and subscribed before me this 31st day of March, 1922.

(Seal) FREDK. SPRENGER,
Notary Public, Westchester County.
Certificate filed in New York County.
(My commission expires March 30, 1924.)

# Exports of India Rubber Manufactures from the

| EXPORTED TO— | Belting Value | Hose Value | Packing Value | Thread Value | Boots Pairs | Boots Value | Shoes Pairs | Shoes Value | Canvas Shoes with Rubber Soles Pairs | Canvas Shoes with Rubber Soles Value | Soles and Heels Pairs | Soles and Heels Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EUROPE | | | | | | | | | | | | |
| Belgium | ..... | ..... | $52 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bulgaria | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Denmark | ..... | ..... | ..... | ..... | ..... | ..... | 3,718 | $5,212 | ..... | ..... | 783 | $399 |
| Finland | $2,868 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| France | 546 | $302 | 150 | $29,122 | ..... | ..... | ..... | ..... | 1,484 | $1,682 | 57 | 50 |
| Germany | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Greece | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 48 | 40 |
| Iceland, etc., Islands | ..... | ..... | ..... | ..... | 48 | $147 | 1,596 | 3,990 | ..... | ..... | ..... | ..... |
| Italy | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Jugoslavia, etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Malta, etc., Islands | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Netherlands | 1,570 | 661 | ..... | ..... | ..... | ..... | 12 | 31 | 8,602 | 8,617 | ..... | ..... |
| Norway | 94 | 74 | ..... | ..... | ..... | ..... | 1,153 | 921 | 1,220 | 759 | 550 | 934 |
| Portugal | ..... | 22 | ..... | ..... | 1,106 | 4,812 | ..... | ..... | ..... | ..... | ..... | ..... |
| Rumania | ..... | ..... | 407 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Spain | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sweden | 1,496 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Switzerland | ..... | ..... | ..... | 3,658 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| England | 297 | 17,691 | 3,146 | 19,532 | 783 | 2,041 | 852 | 2,287 | $1,244 | 38,703 | 3,121 | 842 |
| Scotland | ..... | 190 | ..... | ..... | 72 | 276 | ..... | ..... | 1,368 | 1,280 | ..... | ..... |
| Ireland | ..... | ..... | ..... | ..... | 1 | 6 | ..... | ..... | ..... | ..... | ..... | ..... |
| TOTALS, EUROPE | $6,871 | $18,940 | $3,755 | $52,312 | 2,010 | $7,282 | 7,331 | $12,441 | 63,918 | $51,041 | 4,559 | $2,265 |
| NORTH AMERICA | | | | | | | | | | | | |
| Canada—Maritime Provinces | $14 | $29 | $58 | ..... | 2,093 | $6,845 | 210 | $242 | ..... | ..... | 30 | $17 |
| Quebec and Ontario | 1,349 | 6,512 | 3,419 | $561 | 18 | 54 | 13 | 36 | 323 | $371 | 239 | 139 |
| Prairie Provinces | 305 | 763 | 150 | ..... | 23 | 101 | ..... | ..... | ..... | ..... | ..... | ..... |
| British Columbia and Yukon | 958 | 438 | 34 | ..... | 513 | 2,158 | 75 | 186 | 2 | 16 | ..... | ..... |
| British Honduras | ..... | 41 | 59 | ..... | ..... | ..... | 309 | 315 | 1,000 | 1,051 | ..... | ..... |
| Costa Rica | ..... | 1,102 | 174 | ..... | ..... | ..... | 91 | 75 | ..... | ..... | 1,490 | 979 |
| Guatemala | ..... | 321 | 164 | ..... | ..... | ..... | ..... | ..... | 183 | 206 | 2,845 | 1,839 |
| Honduras | 132 | 753 | ..... | ..... | 6 | 28 | 207 | 165 | 1,718 | 2,210 | 15 | 5 |
| Nicaragua | 1,432 | 154 | 73 | ..... | ..... | ..... | 42 | 34 | 216 | 187 | 196 | 145 |
| Panama | 168 | 2,637 | 40 | ..... | ..... | ..... | 974 | 1,095 | 3,160 | 3,116 | 2,726 | 585 |
| Salvador | 72 | 254 | ..... | 901 | ..... | ..... | 160 | 144 | ..... | ..... | 2,078 | 1,731 |
| Mexico | 14,219 | 25,371 | 7,010 | ..... | 1,758 | 1,729 | 1,687 | 2,351 | 45,535 | 46,586 | 8,530 | 3,347 |
| Miquelon, etc., Islands | ..... | ..... | ..... | ..... | 1,668 | 3,233 | ..... | ..... | ..... | ..... | ..... | ..... |
| Newfoundland and Labrador | 150 | 77 | 19 | ..... | 1,980 | 4,911 | 2,034 | 4,417 | ..... | ..... | 846 | 324 |
| Bermuda | 66 | 2,012 | 12 | ..... | 126 | 206 | 102 | 74 | 963 | 888 | 674 | 438 |
| Barbados | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 126 | 151 | ..... | ..... |
| Jamaica | ..... | 389 | 60 | ..... | ..... | ..... | 48 | 28 | 3,266 | 2,695 | 112 | 55 |
| Trinidad and Tobago | ..... | 9 | 506 | ..... | ..... | ..... | ..... | ..... | 1,008 | 695 | ..... | ..... |
| Other British West Indies | 74 | 152 | 87 | ..... | ..... | ..... | 84 | 40 | 616 | 880 | 107 | 50 |
| Cuba | 451 | 2,492 | 2,060 | ..... | 24 | 150 | ..... | ..... | 7,643 | 5,732 | 6,234 | 2,298 |
| Dominican Republic | 727 | 204 | 309 | ..... | 5 | 14 | ..... | ..... | 1,872 | 1,799 | 878 | 410 |
| Dutch West Indies | ..... | 159 | 33 | ..... | ..... | ..... | 102 | 115 | 1,439 | 1,166 | 246 | 117 |
| French West Indies | 419 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Haiti | ..... | ..... | 187 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Virgin Islands of United States | ..... | 99 | 236 | ..... | ..... | ..... | 48 | 75 | 375 | 471 | 198 | 57 |
| TOTALS, NORTH AMERICA | $20,536 | $43,968 | $14,690 | $1,462 | 8,214 | $19,429 | 6,186 | $9,392 | 69,445 | $68,220 | 27,444 | $12,536 |
| SOUTH AMERICA | | | | | | | | | | | | |
| Argentina | $6,198 | $4,541 | $172 | ..... | ..... | ..... | 1,224 | $893 | 1,128 | $901 | 311 | $152 |
| Bolivia | 793 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,390 | 724 |
| Brazil | 180 | 1,542 | 668 | $1,118 | ..... | ..... | ..... | ..... | ..... | ..... | 1,394 | 416 |
| Chile | 10,127 | 472 | ..... | ..... | 4,398 | $13,200 | ..... | ..... | ..... | ..... | 227 | 115 |
| Colombia | 538 | 675 | 362 | ..... | ..... | ..... | 120 | 128 | 456 | 408 | 1,209 | 531 |
| Ecuador | 238 | 970 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| British Guiana | ..... | ..... | ..... | ..... | ..... | ..... | 48 | 24 | 96 | 115 | ..... | ..... |
| Dutch Guiana | 90 | ..... | 68 | ..... | ..... | ..... | ..... | ..... | 216 | 220 | 89 | 61 |
| Peru | 1,216 | 499 | ..... | ..... | ..... | ..... | ..... | ..... | 68 | 89 | ..... | ..... |
| Uruguay | ..... | ..... | ..... | ..... | ..... | ..... | 350 | 300 | 216 | 115 | 2,948 | 2,004 |
| Venezuela | 523 | 401 | 401 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,519 | 1,217 |
| TOTALS, SOUTH AMERICA | $19,903 | $9,100 | $1,671 | $1,118 | 4,398 | $13,200 | 1,742 | $1,345 | 2,180 | $1,848 | 11,087 | $5,220 |
| OCEANIA | | | | | | | | | | | | |
| Philippine Islands | $578 | $343 | $948 | ..... | ..... | ..... | 28,775 | $21,672 | 9,816 | $8,029 | 12,985 | $6,725 |
| Australia | 4,768 | 2,224 | 1,069 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| British Oceania | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 874 | 1,275 | ..... | ..... |
| French Oceania | 409 | 58 | 507 | ..... | ..... | ..... | ..... | ..... | 369 | 536 | ..... | ..... |
| New Zealand | 275 | 322 | 581 | ..... | 2,502 | $8,565 | 576 | 586 | ..... | ..... | ..... | ..... |
| Other Oceania | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 312 | 615 | ..... | ..... |
| TOTALS, OCEANIA | $6,030 | $2,947 | $3,105 | ..... | 2,502 | $8,565 | 29,351 | $22,258 | 11,371 | $10,455 | 12,985 | $6,725 |
| ASIA | | | | | | | | | | | | |
| British India | $7,141 | $534 | $88 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Ceylon | ..... | 75 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Straits Settlements | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| China | 1,042 | 216 | 929 | ..... | ..... | ..... | 699 | $652 | 168 | $148 | ..... | ..... |
| Chosen | ..... | ..... | 101 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Java and Madura | 66 | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Other Dutch East Indies | ..... | ..... | 577 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Far Eastern Republic | ..... | 280 | 265 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| French Indo-China | 3,852 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hejaz, etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hongkong | ..... | 18 | 978 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Japan | ..... | 139 | 3,429 | $13,145 | 2,724 | $7,144 | 5,044 | 4,915 | ..... | ..... | ..... | ..... |
| Kiyantung | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Palestine and Syria | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 285 | $131 |
| Persia | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Siam | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Turkey in Asia | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 196 | 200 | ..... | ..... |
| TOTALS, ASIA | $12,101 | $1,362 | $6,367 | $13,145 | 2,724 | $7,144 | 5,743 | $5,567 | 364 | $348 | 285 | $131 |
| AFRICA | | | | | | | | | | | | |
| British West Africa | ..... | $300 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| British South Africa | $10,960 | 9,750 | $3,125 | ..... | 168 | $517 | ..... | ..... | 598 | $688 | 3,594 | $1,903 |
| British East Africa | ..... | 95 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Canary Islands | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Egypt | ..... | 320 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Morocco | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Portuguese East Africa | ..... | ..... | 755 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| TOTALS, AFRICA | $10,960 | $10,465 | $3,880 | ..... | 168 | $517 | ..... | ..... | 598 | $688 | 3,594 | $1,903 |
| GRAND TOTALS | $76,401 | $86,782 | $33,468 | $68,037 | 20,016 | $56,137 | 50,353 | $51,003 | 147,876 | $132,600 | 59,954 | $28,780 |

*Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.*

## United States by Countries During February, 1922

| Pneumatic Casings | | | Solid Tires | | Pneumatic Tubes | | | | | Hard Rubber Goods | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Automobile | | | | | Automobile | | | | | | | | | |
| Number | Value | Others Value | Automobile Value | Others Value | Number | Value | Others Value | Tire Repair Materials Value | Druggists' Rubber Sundries Value | Battery Jars and Accessories Value | Other Electrical Supplies Value | Others Value | All Other Rubber Manufactures Value | Totals Value |
| 904 | $17,368 | ..... | ..... | $575 | 637 | $1,405 | $7 | ..... | $315 | ..... | ..... | ..... | $668 | $20,390 |
| 16 | 164 | ..... | ..... | ..... | 16 | 39 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 203 |
| 1,014 | 15,348 | ..... | $3,553 | ..... | 276 | 606 | ..... | $7 | ..... | ..... | ..... | ..... | 415 | 25,540 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 113 | 2,981 |
| 2,565 | 27,968 | ..... | ..... | ..... | 180 | 301 | ..... | 1,571 | 2,474 | $713 | ..... | $2,009 | 2,124 | 69,012 |
| 164 | 2,615 | $140 | 113 | ..... | 71 | 277 | 46 | ..... | ..... | ..... | ..... | ..... | ..... | 3,191 |
| 1,803 | 34,913 | ..... | 522 | 327 | 1,540 | 3,053 | ..... | 298 | ..... | ..... | ..... | ..... | 712 | 39,865 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 15 | ..... | ..... | ..... | ..... | ..... | 4,152 |
| 568 | 7,875 | ..... | ..... | ..... | 472 | 891 | ..... | ..... | ..... | ..... | ..... | ..... | 342 | 9,108 |
| ..... | ..... | ..... | ..... | ..... | 1,400 | 2,759 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,759 |
| 44 | 591 | ..... | ..... | ..... | 8 | 31 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 622 |
| 494 | 7,554 | 748 | 215 | ..... | 245 | 469 | 200 | ..... | 2,674 | ..... | ..... | ..... | 5,570 | 29,243 |
| 1,756 | 35,559 | 173 | ..... | ..... | 1,346 | 3,219 | 18 | 948 | 739 | ..... | ..... | ..... | 1,482 | 43,986 |
| 529 | 8,688 | 690 | ..... | ..... | 456 | 1,105 | 94 | 17 | ..... | ..... | $106 | ..... | 272 | 15,806 |
| 240 | 5,999 | ..... | ..... | ..... | 50 | 195 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 6,601 |
| 929 | 13,065 | ..... | 697 | ..... | 231 | 635 | ..... | 28 | ..... | ..... | ..... | ..... | 120 | 14,545 |
| 1,285 | 21,179 | 866 | ..... | ..... | 891 | 800 | 25 | 812 | ..... | ..... | ..... | ..... | 358 | 25,536 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 842 | 4,500 |
| 17,951 | 220,820 | ..... | 5,424 | ..... | 6,509 | 9,834 | ..... | 2,335 | 38,984 | ..... | 1,268 | 3,487 | 31,578 | 398,269 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,650 | ..... | ..... | 2,182 | ..... | 7,578 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 6 |
| 30,262 | $419,706 | $2,617 | $10,524 | $902 | 14,328 | $25,619 | $390 | $6,031 | $48,836 | $713 | $1,374 | $7,678 | $44,596 | $723,893 |
| 2 | $54 | ..... | ..... | ..... | 2 | $2 | ..... | ..... | $226 | $49 | ..... | ..... | $654 | $8,190 |
| 4,482 | 60,600 | $24 | $5,545 | $12 | 5,590 | 17,623 | ..... | $794 | 14,637 | 3,139 | $862 | $5,000 | 73,496 | 194,173 |
| 237 | 2,826 | 27 | ..... | 40 | 396 | 603 | ..... | 492 | 1,449 | 18 | ..... | 1,713 | 1,747 | 10,234 |
| 9 | 223 | ..... | 749 | 8 | ..... | ..... | ..... | ..... | 362 | 120 | 7 | 55 | 1,299 | 6,613 |
| 6 | 90 | 18 | ..... | ..... | 4 | 15 | ..... | 2 | 86 | ..... | ..... | ..... | 22 | 1,699 |
| 63 | 1,355 | ..... | ..... | ..... | 37 | 74 | ..... | ..... | 133 | ..... | 304 | 22 | 124 | 4,342 |
| 108 | 2,584 | ..... | 70 | 275 | 104 | 282 | ..... | 352 | 56 | 29 | ..... | ..... | 220 | 6,398 |
| 26 | 720 | 11 | ..... | ..... | 22 | 67 | ..... | ..... | 80 | ..... | ..... | ..... | 137 | 4,308 |
| 4 | 114 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 25 | ..... | ..... | ..... | 490 | 2,654 |
| 652 | 8,915 | 299 | 667 | 145 | 884 | 1,525 | $81 | 539 | 44 | ..... | ..... | 9 | 812 | 20,677 |
| 47 | 1,006 | ..... | ..... | ..... | 14 | 69 | ..... | ..... | ..... | ..... | ..... | ..... | 10 | 4,187 |
| 4,397 | 71,769 | 1,275 | 9,972 | 2,870 | 5,814 | 14,554 | 15 | 1,663 | 1,854 | 27 | 2,558 | 1,164 | 12,691 | 220,425 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,233 |
| 4 | 59 | ..... | ..... | ..... | ..... | ..... | 43 | ..... | 11 | ..... | ..... | 86 | 112 | 10,209 |
| ..... | ..... | ..... | ..... | 173 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 12 | 15 | 3,896 |
| 120 | 1,594 | ..... | ..... | ..... | 61 | 177 | ..... | 51 | ..... | ..... | ..... | ..... | 86 | 2,059 |
| 942 | 13,008 | 10 | 3,326 | 46 | 869 | 1,440 | ..... | 196 | ..... | ..... | ..... | 61 | 809 | 22,123 |
| 211 | 2,847 | 120 | ..... | ..... | 127 | 321 | ..... | ..... | ..... | ..... | ..... | ..... | 459 | 4,957 |
| 50 | 523 | 77 | ..... | 23 | 47 | 127 | ..... | ..... | 68 | 40 | 246 | ..... | 83 | 2,470 |
| 7,730 | 91,899 | 338 | 7,930 | 369 | 4,440 | 8,364 | 36 | 598 | 2,483 | ..... | ..... | 422 | 8,603 | 134,225 |
| 196 | 3,681 | 225 | ..... | 80 | 236 | 424 | ..... | ..... | 68 | ..... | 246 | 70 | 144 | 8,401 |
| 67 | 922 | 61 | ..... | 28 | 66 | 101 | 95 | ..... | ..... | ..... | ..... | ..... | ..... | 2,797 |
| 202 | 2,672 | ..... | 82 | 361 | 30 | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,594 |
| 79 | 1,674 | 32 | ..... | ..... | 40 | 111 | ..... | 126 | ..... | ..... | ..... | 15 | 165 | 2,310 |
| 91 | 1,352 | ..... | ..... | ..... | 90 | 140 | ..... | ..... | ..... | ..... | 38 | ..... | 12 | 2,480 |
| 19,725 | $270,487 | $2,517 | $28,341 | $4,430 | 18,873 | $46,079 | $270 | $4,213 | $21,582 | $3,422 | $4,261 | $8,629 | $102,190 | $686,654 |
| 5,930 | $65,381 | $7 | $215 | ..... | 3,857 | $6,796 | ..... | $686 | $2,579 | ..... | $67 | $342 | $7,622 | $96,552 |
| 41 | 1,547 | ..... | ..... | ..... | 83 | 249 | ..... | 15 | ..... | ..... | 20 | ..... | ..... | 3,348 |
| 817 | 11,398 | ..... | 143 | ..... | 450 | 797 | ..... | 735 | 483 | ..... | ..... | 735 | 1,434 | 19,649 |
| 763 | 12,141 | ..... | 159 | ..... | 562 | 1,615 | ..... | 206 | 56 | ..... | ..... | 145 | 656 | 38,892 |
| 275 | 6,475 | 73 | 1,197 | ..... | 231 | 574 | ..... | 161 | 87 | ..... | ..... | ..... | 415 | 11,624 |
| 204 | 3,719 | ..... | ..... | ..... | 158 | 295 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 5,222 |
| 84 | 916 | ..... | ..... | ..... | 185 | 293 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,348 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 365 | 804 |
| 420 | 7,610 | ..... | 1,074 | $38 | 427 | 970 | ..... | 44 | ..... | ..... | ..... | ..... | 538 | 12,078 |
| 1,028 | 15,503 | ..... | 180 | ..... | 126 | 195 | ..... | ..... | 1,046 | ..... | ..... | ..... | 535 | 19,878 |
| 1,190 | 19,218 | 477 | 224 | 66 | 900 | 2,022 | ..... | 204 | 393 | ..... | ..... | ..... | 242 | 25,388 |
| 10,752 | $143,908 | $557 | $3,192 | $104 | 6,979 | $13,806 | ..... | $2,051 | $4,644 | ..... | $87 | $1,222 | $11,807 | $234,783 |
| 1,740 | $24,245 | $738 | $4,075 | $3,160 | 2,177 | $4,569 | $350 | $349 | $166 | ..... | ..... | $138 | $8,882 | $84,967 |
| 1,065 | 14,481 | 383 | 7,139 | 975 | 875 | 1,782 | ..... | 183 | 1,831 | ..... | ..... | 466 | 1,442 | 36,743 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,275 |
| 13 | 175 | 51 | 109 | 139 | 2 | 4 | ..... | ..... | ..... | ..... | ..... | ..... | 21 | 2,009 |
| 1,111 | 21,591 | ..... | 2,407 | ..... | 496 | 1,669 | ..... | 2,156 | 79 | ..... | $200 | ..... | 1,171 | 39,602 |
| 8 | 145 | 89 | 77 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 927 |
| 3,937 | $60,637 | $1,261 | $13,807 | $4,274 | 3,550 | $8,024 | $350 | $2,688 | $2,076 | ..... | $200 | $604 | $11,517 | $165,523 |
| 329 | $3,738 | ..... | $1,488 | ..... | 180 | $308 | ..... | $100 | $341 | ..... | ..... | ..... | $37 | $13,775 |
| 12 | 249 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 324 |
| 1,190 | 15,584 | ..... | 6,300 | ..... | 1,121 | 1,892 | ..... | ..... | 152 | ..... | ..... | ..... | 350 | 24,278 |
| 78 | 1,884 | ..... | ..... | $170 | 51 | 138 | ..... | 1,084 | 905 | ..... | ..... | ..... | 1,575 | 8,743 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 191 |
| 969 | 12,090 | ..... | 969 | ..... | ..... | ..... | ..... | ..... | ..... | $33 | ..... | ..... | 66 | 13,324 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 577 |
| 58 | 1,531 | ..... | ..... | ..... | 58 | 169 | ..... | 377 | ..... | ..... | ..... | ..... | 175 | 2,797 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,852 |
| 268 | $5,852 | ..... | ..... | ..... | 82 | $209 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 6,061 |
| ..... | ..... | ..... | $440 | $1,465 | ..... | ..... | ..... | ..... | 25 | ..... | ..... | ..... | 512 | 3,438 |
| 367 | 4,863 | $564 | 3,172 | ..... | 75 | 200 | ..... | ..... | 95 | ..... | ..... | 367 | 14,020 | 52,053 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,080 | ..... | ..... | ..... | ..... | 1,080 |
| 314 | 3,115 | ..... | ..... | ..... | 208 | 506 | ..... | ..... | ..... | ..... | ..... | ..... | 129 | 3,881 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 187 | ..... | ..... | ..... | ..... | 187 |
| 30 | 354 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 354 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 200 |
| 3,515 | $49,260 | $564 | $12,369 | $1,635 | 1,775 | $3,422 | ..... | $1,561 | $2,785 | $33 | ..... | $367 | $16,864 | $135,025 |
| 401 | $10,828 | ..... | ..... | $800 | 814 | $2,617 | ..... | $35 | ..... | ..... | ..... | ..... | ..... | $14,580 |
| 4,309 | 62,258 | $897 | ..... | 91 | 426 | 1,296 | ..... | 2,553 | $307 | ..... | $325 | $36 | $8,574 | 103,280 |
| 417 | 6,389 | ..... | ..... | ..... | 91 | 250 | ..... | ..... | ..... | ..... | ..... | ..... | 47 | 6,781 |
| 83 | 1,347 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,347 |
| 146 | 1,676 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 49 | 2,045 |
| 240 | 1,971 | ..... | ..... | ..... | 105 | 188 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,159 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 38 | 793 |
| 5,596 | $84,469 | $897 | ..... | $891 | 1,436 | $4,351 | ..... | $2,588 | $307 | ..... | $325 | $36 | $8,708 | $130,985 |
| 73,787 | $1,028,467 | $8,413 | $68,233 | $12,236 | 46,941 | $101,301 | $1,010 | $19,132 | $80,230 | $4,168 | $6,247 | $18,536 | $195,682 | $2,076,863 |

## Exports of Waterproofed Cloth and Clothing from the United States, By Countries[1]

| Exported to— | January, 1922 | | February, 1922 | |
|---|---|---|---|---|
| | Waterproofed and Auto Cloth and Auto Topping Value | Waterproofed Clothing Value | Waterproofed and Auto Cloth and Auto Topping Value | Waterproofed Clothing Value |
| **Europe** | | | | |
| Belgium | $160 | ..... | $550 | ..... |
| Denmark | 1,078 | ..... | ..... | $78 |
| France | 469 | ..... | ..... | ..... |
| Italy | 8,597 | $50 | 45 | ..... |
| Malta, etc., Islands | ..... | ..... | 209 | ..... |
| Netherlands | 87 | ..... | 609 | 72 |
| Norway | ..... | ..... | 115 | ..... |
| Portugal | ..... | ..... | ..... | 53 |
| England | 162 | 1,463 | 6,304 | ..... |
| Scotland | 710 | ..... | ..... | 1,646 |
| Totals, Europe | $11,263 | $1,513 | $7,832 | $1,849 |
| **North America** | | | | |
| Canada—Maritime Provinces | ..... | $245 | $4 | $39 |
| Quebec and Ontario | $7,470 | 53 | 15,117 | ..... |
| Prairie Provinces | 189 | 499 | 28 | 405 |
| British Columbia and Yukon | ..... | 123 | 27 | 103 |
| British Honduras | ..... | ..... | ..... | 24 |
| Costa Rica | 31 | 220 | ..... | ..... |
| Guatemala | 158 | ..... | ..... | 120 |
| Honduras | 181 | 250 | ..... | 293 |
| Nicaragua | 256 | 121 | ..... | 16 |
| Panama | 239 | ..... | 221 | ..... |
| Mexico | 379 | 3,851 | 751 | 10,773 |
| Newfoundland and Labrador | ..... | ..... | ..... | 473 |
| Bermuda | ..... | 64 | 70 | 664 |
| Barbados | ..... | ..... | 153 | ..... |
| Jamaica | 725 | ..... | 298 | ..... |
| Trinidad and Tobago | 351 | ..... | 239 | ..... |
| Other British West Indies | ..... | 69 | 70 | ..... |
| Cuba | 1,174 | 1,560 | 1,462 | 1,116 |
| Dominican Republic | 185 | ..... | ..... | 61 |
| Dutch West Indies | ..... | ..... | 69 | ..... |
| French West Indies | ..... | ..... | 65 | ..... |
| Haiti | 175 | ..... | 93 | ..... |
| Virgin Islands of United States | ..... | ..... | ..... | 12 |
| Totals, North America | $11,513 | $7,055 | $18,667 | $14,099 |
| **South America** | | | | |
| Argentina | $2,736 | ..... | $10,970 | ..... |
| Brazil | 657 | ..... | 2,285 | ..... |
| Chile | 42 | ..... | ..... | ..... |
| Colombia | ..... | ..... | 438 | ..... |
| French Guiana | ..... | $1,312 | ..... | ..... |
| Peru | ..... | ..... | 383 | ..... |
| Uruguay | ..... | ..... | 2,034 | ..... |
| Venezuela | ..... | ..... | 287 | ..... |
| Totals, South America | $3,435 | $1,312 | $16,397 | ..... |
| **Oceania** | | | | |
| Philippine Islands | $1,098 | ..... | $2,502 | $1,794 |
| Australia | 4,291 | $335 | 1,636 | 1,082 |
| New Zealand | 1,390 | ..... | 275 | ..... |
| Totals, Oceania | $6,779 | $335 | $4,413 | $2,875 |
| **Asia** | | | | |
| Ceylon | $227 | ..... | ..... | ..... |
| Straits Settlements | 6 | ..... | ..... | ..... |
| China | 608 | ..... | $3,312 | ..... |
| Hongkong | ..... | ..... | 111 | ..... |
| Japan | ..... | ..... | 3,750 | ..... |
| Totals, Asia | $841 | ..... | $7,173 | ..... |
| **Africa** | | | | |
| British South Africa | ..... | ..... | $1,078 | $1,254 |
| Spanish Africa | $385 | $873 | ..... | ..... |
| Egypt | ..... | ..... | 484 | ..... |
| Totals, Africa | $385 | $873 | $1,562 | $1,254 |
| Grand totals | $34,216 | $11,088 | $56,044 | $20,078 |

[1]Export figures as issued by the Department of Commerce, for waterproofed cloth, automobile cloth and topping and waterproofed clothing, were not included in the January and February monthly statements for rubber goods, as such materials were given a separate classification, but included in the textile group. In the future they will appear with the regular monthly figures covering rubber goods.

## Imports of Crude Rubber Into the United States by Customs Districts

| | March, 1922 | |
|---|---|---|
| | Pounds | Value |
| Massachusetts | 673,123 | $100,654 |
| New York | 61,595,244 | 10,553,387 |
| Los Angeles | 1,472,775 | 266,922 |
| San Francisco | 239,080 | 36,077 |
| Colorado | 235,000 | 42,000 |
| Totals | 64,215,222 | $10,999,040 |

## Official India Rubber Statistics for the United States

### Imports of Crude and Manufactured Rubber

| | February | | | |
|---|---|---|---|---|
| | 1921 | | 1922 | |
| | Pounds | Value | Pounds | Value |
| UNMANUFACTURED—*free* | | | | |
| India rubber | | | | |
| From France | ..... | ..... | 185,800 | $5,574 |
| Netherlands | 360,640 | $74,928 | 242,130 | 43,876 |
| Portugal | ..... | ..... | 555,962 | 23,690 |
| United Kingdom | 66,981 | 11,303 | 14,184,538 | 2,736,812 |
| Canada | ..... | ..... | 11,716 | 1,732 |
| Central America | 1,609 | 384 | 3,243 | 324 |
| Mexico | ..... | ..... | 121,000 | 24,200 |
| Brazil | 1,147,124 | 210,290 | 2,782,351 | 354,257 |
| Other South America | 28,132 | 12,757 | 79,772 | 16,467 |
| British East Indies | 17,081,824 | 5,510,998 | 39,423,170 | 6,225,744 |
| Dutch East Indies | 3,217,698 | 1,054,815 | 7,965,091 | 1,296,893 |
| Other countries | 29,160 | 10,202 | 1,189,467 | 97,537 |
| Totals | 21,933,165 | $6,885,677 | 66,744,240 | $10,827,106 |
| Balata | 187,356 | 114,432 | 145,925 | 75,920 |
| Jelutong (Pontianak) | 378,565 | 49,260 | 171,053 | 13,927 |
| Gutta percha | 251,611 | 42,406 | 68,800 | 12,241 |
| Rubber scrap | 277,849 | 13,733 | 720,899 | 16,860 |
| Totals, unmanufactured | 23,028,546 | $7,015,508 | 67,850,917 | $10,946,054 |
| Chicle ..... *dutiable* | 956,209 | 474,545 | 1,349,147 | 659,241 |
| MANUFACTURED—*dutiable* | | | | |
| India rubber and gutta percha | ..... | 56,009 | ..... | 159,707 |
| India rubber substitutes | ..... | 250 | ..... | 120 |

### Exports of Domestic Merchandise

| | | | | |
|---|---|---|---|---|
| MANUFACTURED | | | | |
| India rubber | | | | |
| Reclaimed | 60,493 | $8,810 | 193,807 | $22,004 |
| Scrap and old | 795,187 | 47,005 | 697,679 | 27,663 |
| Footwear | | | | |
| Boots[1] ..... *pairs* | 7,533 | 28,247 | 20,016 | 56,137 |
| Shoes[1] ..... *pairs* | 207,917 | 246,603 | 50,353 | 51,003 |
| Canvas shoes with rubber soles[1] ..... *pairs* | ..... | ..... | 147,876 | 132,600 |
| Druggists' rubber sundries[1] | ..... | 106,096 | 66,774 | 80,230 |
| Hard rubber goods | | | | |
| Battery jars and accessories[1] | ..... | ..... | 13,967 | 4,168 |
| Other electrical supplies[1] | ..... | ..... | 8,991 | 6,247 |
| Other hard rubber goods[1] | ..... | ..... | 14,881 | 18,536 |
| Tires | | | | |
| Pneumatic casings | | | | |
| For automobiles[1] | ..... | 1,248,540 | 73,787 | 1,028,467 |
| Other[1] | ..... | ..... | 2,272 | 8,413 |
| Pneumatic tubes | | | | |
| For automobiles[1] | ..... | 140,115 | 46,941 | 101,301 |
| Other[1] | ..... | ..... | 930 | 1,010 |
| Solid tires | | | | |
| For automobiles and motor trucks[1] | ..... | 110,724 | 2,388 | 68,233 |
| Other[1] | ..... | ..... | 36,333 | 12,236 |
| All other tires[1] | ..... | 39,993 | ..... | ..... |
| Tire repair materials[1] | ..... | ..... | 71,242 | 19,132 |
| Belting[1] | ..... | 182,471 | 135,736 | 76,401 |
| Hose[1] | ..... | 369,210 | 226,720 | 86,782 |
| Packing[1] | ..... | 96,581 | 65,886 | 33,468 |
| Soles and heels[1] | ..... | 75,440 | 59,954 | 28,780 |
| Thread[1] | ..... | ..... | 56,142 | 68,037 |
| Other rubber manufactures[1] | ..... | 532,638 | 387,278 | 195,682 |
| Totals, manufactured | 1,071,130 | $3,232,473 | 2,379,953 | $2,126,530 |
| MANUFACTURED | | | | |
| Fountain pens ..... *number* | 35,959 | $56,153 | 4,716 | $5,707 |
| Insulated wire and cables | ..... | ..... | 55,895 | 11,867 |

### Exports of Foreign Merchandise

| | | | | |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| India rubber | 722,789 | $134,758 | 797,857 | $159,809 |
| Balata | 82,163 | 29,391 | 67,784 | 38,791 |
| Totals, unmanufactured | 804,952 | $164,129 | 865,641 | $198,600 |
| MANUFACTURED | | | | |
| Gutta percha and india rubber | ..... | $12,051 | ..... | $3,966 |
| India rubber substitutes | ..... | ..... | ..... | ..... |
| Totals, manufactured | ..... | $12,051 | ..... | $3,966 |

[1]Details of exports of domestic merchandise by countries during February, 1922, appear in this issue.

# United Kingdom Rubber Statistics

## Imports

| | February 1921 Pounds | February 1921 Value | February 1922 Pounds | February 1922 Value |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| Crude rubber | | | | |
| From— | | | | |
| Straits Settlements | 4,631,200 | £251,928 | 1,074,000 | £44,902 |
| Federated Malay States | 4,705,900 | 270,635 | 3,952,300 | 183,802 |
| British India | 1,762,500 | 71,610 | 776,600 | 34,717 |
| Ceylon and dependencies | 3,648,300 | 204,014 | 2,514,600 | 111,598 |
| Other Dutch possessions in Indian Seas | 635,500 | 35,749 | 94,400 | 4,374 |
| Dutch East Indies (except other Dutch possessions in Indian Seas) | 1,972,600 | 107,126 | 664,500 | 28,880 |
| Other countries in East Indies and Pacific not elsewhere specified | 387,900 | 19,872 | 34,100 | 1,715 |
| Brazil | 432,900 | 16,706 | 665,700 | 28,792 |
| Peru | 7,900 | 433 | ..... | ..... |
| South and Central America (except Brazil and Peru) | 72,800 | 37,780 | 49,300 | 1,950 |
| West Africa | | | | |
| Gold Coast | 2,800 | 150 | 200 | 6 |
| Other parts of West Africa | 55,300 | 2,688 | 20,700 | 818 |
| East Africa (including Madagascar) | 45,100 | 2,410 | 2,600 | 53 |
| Other countries | 77,400 | 4,261 | 25,600 | 1,208 |
| Totals | 17,938,100 | £991,362 | 9,874,600 | £442,815 |
| Waste and reclaimed rubber | 36,300 | 528 | 61,000 | 731 |
| Gutta percha and balata | 855,600 | 155,507 | 369,600 | 49,411 |
| Rubber substitutes | 22,700 | 620 | ..... | ..... |
| Totals unmanufactured | 18,852,700 | £1,148,017 | 10,305,200 | £492,957 |
| MANUFACTURED | | | | |
| Boots and shoes..*dozen pairs* | 9,193 | £17,471 | 15,463 | £36,126 |
| Waterproof clothing | ..... | 376 | ..... | 500 |
| Insulated Wire | ..... | 3,607 | ..... | 3,566 |
| Tires and tubes | ..... | 213,264 | ..... | 398,716 |
| Other rubber manufactures | ..... | 63,557 | ..... | 66,725 |
| Totals, manufactured | ..... | £293,275 | ..... | £505,633 |

## Exports

| | | | | |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| Waste and reclaimed rubber | 504,600 | £16,567 | 426,100 | £6,436 |
| Rubber substitutes | 25,900 | 1,645 | 64,100 | 1,591 |
| Totals, unmanufactured | 530,500 | £18,312 | 490,200 | £8,027 |
| MANUFACTURED | | | | |
| Boots and shoes..*dozen pairs* | 11,674 | £23,654 | 6,658 | £13,142 |
| Waterproof clothing | ..... | 70,946 | ..... | 59,319 |
| Insulated wire | ..... | 143,780 | ..... | 40,926 |
| Submarine cables | ..... | 106,752 | ..... | 61,085 |
| Tires and tubes | ..... | 167,473 | ..... | 119,660 |
| Other rubber manufactures | ..... | 200,138 | ..... | 229,534 |
| Totals, manufactured | ..... | £712,743 | ..... | £523,666 |

## Exports—Colonial and Foreign

| | | | | |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| Crude rubber | | | | |
| To Sweden, Norway and Denmark | 324,000 | £16,741 | 99,100 | £3,848 |
| Germany | 1,207,400 | 58,835 | 1,623,600 | 65,805 |
| Belgium | 155,500 | 8,856 | 301,300 | 13,379 |
| France | 499,800 | 30,264 | 2,512,000 | 108,528 |
| Spain | 34,300 | 1,859 | 162,900 | 6,696 |
| Italy | 100,000 | 5,879 | 303,900 | 13,153 |
| Austria | 567,600 | 29,544 | 22,500 | 748 |
| Other European countries | 585,300 | 22,649 | 182,200 | 8,547 |
| United States | 300,500 | 17,173 | 9,176,100 | 421,821 |
| Canada | ..... | ..... | 190,200 | 7,010 |
| Other countries | 15,600 | 909 | 6,700 | 310 |
| Totals | 3,790,000 | £192,709 | 14,580,500 | £649,845 |
| Waste and reclaimed rubber | ..... | ..... | 14,500 | £345 |
| Gutta percha and balata | 83,200 | £15,986 | 44,700 | 6,038 |
| Rubber substitutes | 12,700 | 325 | 13,900 | 285 |
| Totals, unmanufactured | 3,885,900 | £209,020 | 14,653,600 | £656,513 |
| MANUFACTURED | | | | |
| Boots and shoes..*dozen pairs* | 14 | £47 | 156 | £841 |
| Waterproof clothing | ..... | ..... | ..... | 24 |
| Tires and tubes | ..... | 40,821 | ..... | 17,366 |
| Other manufactures | ..... | 1,771 | ..... | 3,286 |
| Totals, manufactured | ..... | £42,639 | ..... | £21,517 |

# Rubber Statistics for the Dominion of Canada

## Imports of Crude and Manufactured Rubber

| | January 1921 Pounds | January 1921 Value | January 1922 Pounds | January 1922 Value |
|---|---|---|---|---|
| UNMANUFACTURED—*free* | | | | |
| Rubber, gutta percha, etc. | | | | |
| From United Kingdom | 246,056 | $76,828 | 7,707 | $1,573 |
| United States | 965,233 | 219,515 | 1,362,683 | 257,876 |
| British East Indies | | | | |
| Ceylon | 112,010 | 31,633 | 112,000 | 21,683 |
| Straits Settlements | 440,345 | 103,686 | 1,124,221 | 207,233 |
| Total | 1,763,644 | $431,662 | 2,606,611 | $488,365 |
| Rubber, recovered | 129,736 | 21,630 | 19,295 | 2,270 |
| Rubber, powdered, and rubber or gutta percha scrap | 17,723 | 1,396 | 60,627 | 5,719 |
| Rubber substitutes | 134,888 | 23,099 | 69,402 | 12,193 |
| Totals, unmanufactured | 2,045,991 | $477,787 | 2,755,935 | $508,547 |
| PARTLY MANUFACTURED | | | | |
| Hard rubber sheets and rods | 7,581 | 3,662 | 48 | 56 |
| Hard rubber tubes | ..... | 1,812 | ..... | 912 |
| Rubber thread, not covered | 131 | 185 | 10,169 | 12,628 |
| Totals, partly manufactured | 7,712 | $5,659 | 10,217 | $13,596 |
| MANUFACTURED | | | | |
| Belting | ..... | $14,979 | ..... | $4,525 |
| Hose | ..... | 14,478 | ..... | 5,807 |
| Packing | ..... | 6,741 | ..... | 1,983 |
| Boots and shoes | ..... | 3,341 | ..... | 1,946 |
| Clothing, including waterproofed | ..... | 16,562 | ..... | 8,718 |
| Gloves | ..... | 1,919 | ..... | 1,195 |
| Hot-water bottles | ..... | 1,908 | ..... | 985 |
| Tires, solid | ..... | 23,188 | ..... | 16,826 |
| Tires, pneumatic | ..... | 90,316 | ..... | 53,930 |
| Inner tubes | ..... | 13,802 | ..... | 7,095 |
| Elastic, round or flat | ..... | 18,677 | ..... | 27,369 |
| Mats and matting | ..... | 117 | ..... | 246 |
| Cement | ..... | 2,060 | ..... | 1,928 |
| Other rubber manufactures | ..... | 113,425 | ..... | 75,864 |
| Totals, manufactured | ..... | $321,513 | ..... | $208,417 |
| Totals, rubber imports | 2,053,703 | $804,959 | 2,766,152 | $730,560 |
| Insulated wire and cables | | | | |
| Wire and cables covered with cotton, linen, silk, rubber, etc. | ..... | $8,609 | ..... | $5,767 |
| Copper wire and cables, covered as above | ..... | 23,240 | ..... | 11,185 |
| Fillets | ..... | 369 | ..... | ..... |
| Webbing | ..... | 15,660 | ..... | 28,262 |
| Fountain pens | ..... | 2,156 | ..... | 2,231 |

## Exports of Domestic and Foreign Rubber Goods

| | January 1921 Produce of Canada Value | January 1921 Reexports of Foreign Goods Value | January 1922 Produce of Canada Value | January 1922 Reexports of Foreign Goods Value |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| Crude and waste rubber | $720 | ..... | $7,961 | $184 |
| MANUFACTURED | | | | |
| Belting | $16,046 | ..... | $14,453 | ..... |
| Hose | 34,110 | ..... | 4,622 | ..... |
| Boots and shoes | 233,327 | $382 | 75,862 | 415 |
| Clothing, including waterproofed | 376 | 818 | 1,050 | 22 |
| Tires, pneumatic | 348,307 | ..... | 214,810 | ..... |
| Tires | 8,047 | 23,096 | 10,399 | 1,949 |
| Other manufactures | 68,870 | 3,660 | 44,467 | 2,089 |
| Totals, manufactured | $709,083 | $27,956 | $365,663 | $4,475 |
| Totals, rubber exports | $709,803 | $27,956 | $373,624 | $4,659 |

# Rubber Statistics for Scandinavia

## Sweden

### Imports of Crude and Manufactured Rubber

| | December 1920 | December 1921 | Twelve Months Ended December 31 1920 | Twelve Months Ended December 31 1921 |
|---|---|---|---|---|
| UNMANUFACTURED— | | | | |
| Crude rubber.....*kilos*[1] | 182,433 | 79,798 | 1,592,365 | 826,469 |
| MANUFACTURED— | | | | |
| Rubber footwear | 7,162 | 22,791 | 100,970 | 84,079 |
| Clothing and similar goods coated or impregnated with rubber | 9,210 | 12,618 | 450,997 | 183,120 |
| All other rubber goods | 118,306 | 97,042 | 3,407,250 | 1,260,957 |

## Sweden—Continued

### Exports of Crude and Manufactured Rubber

| | December | | Twelve Months Ended December 31 | |
|---|---|---|---|---|
| | 1920 | 1921 | 1920 | 1921 |
| UNMANUFACTURED— | | | | |
| Waste and old rubber | 3,102 | 56,335 | 285,543 | 214,626 |
| MANUFACTURED— | | | | |
| Footwear | 6,182 | 15,994 | 99,131 | 286,387 |

## Norway

### Imports of Crude and Manufactured Rubber

| | December | | Twelve Months Ended December 31 | |
|---|---|---|---|---|
| | 1920 | 1921 | 1920 | 1921 |
| UNMANUFACTURED— | | | | |
| Crude rubber and gutta percha.*kilos*[1] | 14,095 | 26,460 | 245,245 | 193,241 |
| MANUFACTURED— | | | | |
| Oiled and rubberized clothing | 2,061 | 3,455 | 152,647 | 53,255 |
| Rubber in sheets, threads, tubes, etc. | 21,696 | 6,447 | 279,168 | 122,511 |
| Soles, rings, mats, etc. | 32,165 | 24,232 | 676,237 | 269,575 |
| Footwear | 95,232 | 38,343 | 675,659 | 345,260 |
| Other rubber goods | 2,438 | 2,360 | 48,301 | 26,839 |

### Exports of Crude and Manufactured Rubber

| | December | | Twelve Months Ended December 31 | |
|---|---|---|---|---|
| | 1920 | 1921 | 1920 | 1921 |
| UNMANUFACTURED— | | | | |
| Waste | 12,045 | 9,000 | 156,360 | 86,198 |
| MANUFACTURED— | | | | |
| Footwear, etc. | 22 | 351 | 116 | 394 |
| Oiled and rubberized clothing | 2,502 | 3,871 | 33,659 | 39,661 |

## Denmark

### Imports of Crude and Manufactured Rubber

| | December | | Twelve Months Ended December 31 | |
|---|---|---|---|---|
| | 1920 | 1921 | 1920 | 1921 |
| UNMANUFACTURED— | | | | |
| Crude rubber.....*kilos*[1] | 302 | 167 | 5,077 | 2,582 |
| MANUFACTURED— | | | | |
| Footwear | 281 | 177 | 2,196 | 963 |
| Cycle tires | 1,331 | 741 | 16,559 | 7,599 |
| Hose | 109 | 163 | 1,323 | 1,137 |
| Manufactures of rubber combined with fabric | 259 | 248 | 4,888 | 3,240 |
| Manufactures of rubber without fabric | 164 | 148 | 2,652 | 1,623 |

[1] One kilo equals 2.2 pounds.

## Annual Rubber Statistics for France

### Imports of Crude and Manufactured Rubber

| | 1921 | | |
|---|---|---|---|
| | General Imports French and Foreign 100 Kilos | Used in France 100 Kilos | Francs |
| UNMANUFACTURED | | | |
| Crude rubber and gutta percha | | | |
| From Brazil | 30,380 | 29,222 | ..... |
| England | 90,715 | 84,286 | ..... |
| French Congo | 2,345 | 2,345 | ..... |
| Senegal | 201 | 201 | ..... |
| Other French African colonies | 6,299 | 6,299 | ..... |
| British Indies | 18,129 | 17,380 | ..... |
| Other countries | 57,809 | 50,913 | ..... |
| Total imports, unmanufactured | 205,878 | 190,646 | 150,991 |
| MANUFACTURED | | | |
| Pure rubber sheets, not vulcanized | 948 | 795 | 2,385 |
| Rubber thread | 1,712 | 1,674 | 6,026 |
| Elastic fabrics | 411 | 279 | 1,116 |
| Rubbered fabric.....*pieces* | 417 | 294 | 1,176 |
| Articles made of rubberized fabric | 231 | 1 | 6 |
| Garment protectors | 13 | 12 | 64 |
| Garters, suspenders, belts | 41 | 36 | 191 |
| Rubberized clothing | 457 | 209 | 1,359 |
| Rubberized fabric for card clothing | 465 | 233 | 489 |
| Footwear | 2,912 | 1,490 | 2,682 |
| Tires, tubes, casings | 26,864 | 10,571 | 28,542 |
| Belting, hose, valves, etc. | 11,648 | 10,758 | 16,137 |
| Total imports, manufactured | 46,119 | 26,352 | 60,173 |

### Exports of Crude and Manufactured Rubber

| | 1921 | | |
|---|---|---|---|
| | General Exports French and Foreign 100 Kilos | French Exports 100 Kilos | Francs |
| UNMANUFACTURED | | | |
| Crude rubber and gutta percha | | | |
| To England | 4,890 | 2,209 | 12,213 |
| United States | 3,405 | 2,727 | 17,825 |
| Germany | 6,658 | 5,022 | 73,112 |
| Other countries | 41,901 | 30,230 | |
| Total exports, unmanufactured | 56,854 | 40,008 | 103,150 |
| MANUFACTURED | | | |
| Sheets, unvulcanized and vulcanized | 1,541 | 348 | 887 |
| threads | 789 | 657 | 2,345 |
| Elastic fabric | 2,076 | 1,943 | 6,937 |
| Rubberized fabric in pieces | 1,410 | 1,173 | 2,426 |
| Rubberized fabric for card clothing | 4,470 | 4,231 | 24,455 |
| Clothing | 461 | 229 | 1,226 |
| Articles of rubberized fabric | 46,749 | 45,325 | 17,053 |
| Footwear | | | |
| Tires, tubes, casings | | | |
| To England | 39,811 | 35,715 | ..... |
| Germany | 800 | 700 | ..... |
| Belgium | 14,265 | 12,580 | ..... |
| Switzerland | 7,967 | 7,562 | ..... |
| Other countries | 92,886 | 83,726 | ..... |
| Totals | 155,729 | 140,283 | 357,722 |
| Belting, hose, valves, etc. | 17,768 | 17,008 | 24,577 |
| Total exports, manufactured | 386,722 | 351,480 | 497,628 |

## The Market for Rubber Scrap

The rubber scrap market for the past month has exhibited the same features of general dullness that has characterized it for a long period. There has been some business done in boots and shoes and red inner tubes, entirely on small orders. In No. 1 inner tubes and mixed tires there has been very little mill business and these grades are hardly less stagnant than mechanicals which still continue without market value.

The firm upward tendency in crude rubber prices and increase in activity on the part of the tire and rubber manufacturing plants lend hopefulness to the scrap dealers outlook.

### Quotations for Carload Lots Delivered

April 27, 1922

**Prices subject to change without notice**

| | | | |
|---|---|---|---|
| **Boots and Shoes** | | | |
| Boots and shoes | *lb.* | $0.02¼ @ | $0.03 |
| Trimmed arctics | *lb.* | .02 @ | |
| Untrimmed arctics | *lb.* | .01¼ @ | |
| **Hard Rubber** | | | |
| Battery jars, black compound | *lb.* | @ | |
| No. 1, bright fracture | *lb.* | .05 @ | .06 |
| **Inner Tubes** | | | |
| No. 1 | *lb.* | .03¼ @ | .04 |
| Compounded | *lb.* | .02¼ @ | .03 |
| Red | *lb.* | .03 @ | |
| **Mechanicals** | | | |
| Black scrap, mixed, No. 1 | *lb.* | *.02¼ @ | .03 |
| No. 2 | *lb.* | *.01½ @ | .02 |
| Heels | *lb.* | *.02½ @ | .03 |
| Horse-shoe pads | *lb.* | *.02½ @ | .03 |
| Hose, air brake | *lb.* | *.01 @ | .01¼ |
| fire, cotton lined | *lb.* | *.01 @ | |
| garden | *lb.* | .07 @ | |
| Matting | *lb.* | *.01 @ | |
| Red packing | *lb.* | *.04½ @ | .05 |
| Red scrap, No. 1 | *lb.* | *.07 @ | .08 |
| No. 2 | *lb.* | .05½ @ | .06 |
| White scrap, No. 1 | *lb.* | *.07 @ | .07½ |
| No. 2 | *lb.* | .06 @ | .06½ |
| **Tires** | | | |
| PNEUMATIC— | | | |
| Auto peelings | *lb.* | .01½ @ | |
| Bicycle | *lb.* | .01 @ | .01¼ |
| Standards white auto | *lb.* | *.02¼ @ | .02¼ |
| Mixed auto | *lb.* | .00¾ @ | .01 |
| Stripped, unguaranteed | *lb.* | *.01 @ | .01½ |
| White, G. & G., M. & W., and U. S. | *lb.* | *.02¾ @ | |
| SOLID— | | | |
| Carriage | *lb.* | *.02¼ @ | .02¼ |
| Irony | *lb.* | @ | |
| Truck, clean | *lb.* | *.01½ @ | .02 |

* Nominal.

## The Market for Cotton and Other Fabrics

### New York

AMERICAN COTTON. The course of the New York market for middling spot cotton has been marked by moderate fluctuations. The highest quotation for the past month was 18.15 cents and the lowest 17.75 cents, averaging 18 cents.

The belief is general that there will be a moderate increase in acreage planted and more dependence placed on the use of fertilizers than heretofore, in anticipation of securing a much needed increase in the crop.

Such an increase depends upon the boll weevil and the character of the growing season. The uncertainty of these factors has constant influence on the market.

EGYPTIAN COTTON. Prices for Sakellaridis have remained firm, although little or no business has been done in this country. The demand from Liverpool has been large enough to hold the Alexandria market up. Upper Egyptian grades have been in some demand for prompt shipment at prices ranging from 23½ to 25 cents. As the permanent tariff bill comes up for consideration in the Senate, there is some question about a possible duty on Uppers. The bill as reported by the Senate Finance Committee carries Uppers on the free list. It is expected that the matter will be brought up in the Senate as buyers do not want to have cotton in transit to this country which may be taxed on arrival.

ARIZONA COTTON. Arizona Pima cotton has weakened considerably, No. 2 government standard 1⅝-inch staple being offered in a few cases as low as 32 cents, and some sales being reported at a lower figure. There has been a small demand for this quality of cotton.

SEA ISLAND COTTON. Sea Island cotton has been in extremely light demand.

DRILLS, DUCKS AND OSNABURGS. On these grades, including ducks for mechanical rubber goods, the market is stronger. The demand is improving and prices are firm.

An active market is expected through June and higher prices than are now current.

RAINCOAT CLOTHS. There has been small buying of spot goods and most of the off price merchandise has been purchased. Prices of goods in the gray have advanced a trifle but those for finished goods will not be changed if possible. Consumers report a slight improvement in their business, which is encouraging.

SHEETINGS. Buying is reduced to very small lots. A few numbers in sheetings for export are moving fairly well but there seems to be no encouragement for buyers to take cloth in good lots. The market is in a drifting condition.

TIRE FABRICS. There is no interest in the better staples, Sakellaridis or Sea Island. The market has not improved much as to prices. There are indications for better demand, however. The Egyptian situation will improve and it is said that prices will be higher next month.

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
Fisk Building
Broadway at 57th Street

### New York Quotations

April 27, 1922

Prices subject to change without notice

**Burlaps**

| | | | |
|---|---|---|---|
| 40—7-ounce | 100 yds. | $4.20 | @$4.25 |
| 36—7½-ounce | | 4.40 | @ 4.45 |
| 40—8-ounce | | 4.45 | @ 4.50 |
| 40—10-ounce | | 6.35 | @ 6.40 |
| 40—10½-ounce | | 6.40 | @ 6.45 |

**Drills**

| | | | |
|---|---|---|---|
| 38-inch 2.00-yard | yard | .16¼ | @ |
| 40-inch 3.47-yard | | .09⅝ | @ |
| 52-inch 1.90-yard | | .19 | @ |
| 60-inch 1.52-yard | | .23 | @ |

**Duck**

CARRIAGE CLOTH

| | | | |
|---|---|---|---|
| 38-inch 2.00-yard enameling duck | yard | .17 | @ |
| 40-inch 1.47-yard | | .22⅞ | @ |
| 72-inch 16.66-ounce | | .38½ | @ |
| 72-inch 17.21-ounce | | .39¾ | @ |

MECHANICAL

| | | | |
|---|---|---|---|
| Hose | pound | .31 | @ |
| Belting | | .32 | @ |

**Osnaburgs**

| | | | |
|---|---|---|---|
| 40-inch 2.35-yard | | .14⅛ | @ |
| 40-inch 2.48-yard | | .13⅜ | @ |
| 37½-inch 2.42-yard | | .13⅝ | @ |

**Hollands, 40-inch**

DEAD FINISH

| | | | |
|---|---|---|---|
| Standard, 36-inch, white | | .18 | @ |
| 36-inch, colors | | .18 | @ |
| 42-inch, white | | .22 | @ |
| 42-inch, colors | | .22 | @ |

FLAT FINISH

| | | | |
|---|---|---|---|
| Imperial, 36-inch, white | | .14 | @ |
| 36-inch, colors | | .14 | @ |
| 42-inch, white | | .17 | @ |
| 42-inch, colors | | .17 | @ |

**Raincoat Fabrics**

COTTON

| | | | |
|---|---|---|---|
| Bombazine 64 x 60 | yard | | @ |
| 60 x 48 | | .11¼ | @ |
| Cashmeres, cotton and wool, 36-inch, tan | | .10¾ | @ |
| Twills 64 x 72 | | .50 | @ |
| 60 x 102 | | | @ |
| Twill, mercerized, 36-inch, blue and black | | | @ |
| tan and olive | | | @ |

**Raincoat Fabrics—*Continued***

| | | |
|---|---|---|
| Tweed | | $0.20@$1.00 |
| printed | | .15 @ |
| Plaids 60 x 48 | | .11½@ |
| 56 x 44 | | .10¼@ |
| Prints 60 x 48 | | .12 @ |
| 64 x 60 | | .13 @ |

**Sheetings, 40-inch**

| | | |
|---|---|---|
| 48 x 48, 2.50-yard | *yard* | .12½@ |
| 48 x 48, 2.85-yard | | .10¾@ |
| 64 x 68, 3.15-yard | | .12¼@ |
| 56 x 60, 3.60-yard | | .10¼@ |
| 48 x 44, 3.75-yard | | .09 @ |

**Silks**

| | | |
|---|---|---|
| Canton, 38-inch | *yard* | .29½@ |
| Schappe, 36-inch | | .45 @ |

**Tire Fabrics**

BUILDING

| | | | |
|---|---|---|---|
| 17¼-ounce Sakellaridis, combed | *pound* | .85 @ | |
| 17¼-ounce Egyptian, combed | | .68 @ | .70 |
| 17¼-ounce Egyptian, carded | | .65 @ | .68 |
| 17¼-ounce Peeler, combed | | .70 @ | .75 |
| 17¼-ounce Peeler, carded | | .50 @ | .55 |

CORD

| | | | |
|---|---|---|---|
| 15-ounce Egyptian | *pound* | .73 @ | .78 |

BICYCLE

| | | | |
|---|---|---|---|
| 8-ounce American | *pound* | @ | |
| 10-ounce American | | @ | |

CHAFER

| | | | |
|---|---|---|---|
| 9¼-ounce Sea Island | *pound* | @ | |
| 9¼-ounce Egyptian, carded | | .73 @ | |
| 9¼-ounce Peeler, carded | | .58 @ | |

## TIME STUDY METHODS

The subject of time study is receiving much attention of late, not only by factory executives but by physiologists and psychologists. The Taylor Society, a well-known organization connected with the Engineering Societies, compares the two methods of time study by means of stop-watches and micromotion apparatus, summarizing the main points as follows: the stop-watch, with dial graduated in hundredths, so that hundredths of a minute can be read, records the length of time taken by the average workman in the performance of a certain task. A dozen such observations are taken, and the results compared. The micromotion apparatus consists of a moving-picture camera; a clock of which the dial is graduated into hundredths and the hand makes a complete revolution in exactly one minute; slates with recorded data; and a background (wall) ruled into squares of known dimensions. A film is then made of the operation, including clock, slates and background squares. The micromotion studies are supposed to capture the experience of the most skilled workman and record it for the benefit of all, while they are also useful for purposes of analysis, measurement, and comparison.

According to H. S. Person, managing director of the Taylor Society, the data thus far presented are not sufficient to warrant a verdict regarding the two methods. While the micromotion method may be superior for certain purposes, for the great majority of purposes in industrial research the stop-watch method gives entire satisfaction. It is relevant, in this connection, to quote a statement made by another authority: "In my opinion time study will be improved by greater attention to the standardization of the human machine rather than by a further refinement of the technique of time measurement. It is sounder scientific procedure to get after the big errors first. At present these large errors lie along the lines of human standardization and not in the method of time measurement."

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CYRUS S. CHING, HEAD OF THE INDUSTRIAL RELATION DEPARTMENT of the United States Rubber Co., is much in demand as a speaker at foremen's conferences, several of which have been held in various Massachusetts cities recently.

# The Market for Chemicals and Compounding Ingredients

## New York

Business during the past month has shown substantial improvement in many rubber chemicals and some items were in normal demand. Advances in price have been few. Gasoline went up one cent a gallon about the middle of the month in anticipation of the heavy seasonal demand for motor use. Sublimed white lead increased ¼-cent a pound.

ANILINE. The trade has not been characterized by much interest the past month, the demand being hardly better than routine. The outlook is somewhat uncertain for the immediate future.

ANTIMONY SULPHIDES. The continued low prices have not developed even routine business. The supply is still in excess of requirements. This condition waits for remedy largely on the spring demand from inner tube makers.

BARYTES. The call for this item has continued to stimulate business in barytes quite encouragingly for producers and dealers.

BENZOL. This material has continued high in price with large export supplies sought for, which cannot be met, in view of the needs of the domestic market and the shortness of supply. If the coal strike is unusually prolonged the supply of benzol will be curtailed by stoppage of the coke ovens for lack of bituminous coal for coke making.

BLANC FIXE. Sales have continued active and seasonal prospects bright.

CARBON BISULPHIDE. Large requirements for the rubber trade materialized about the middle of the month, bringing activity and firmness to an otherwise quiet market.

CARBON TETRACHLORIDE. Trade early in the month was only routine. The rubber trade later sought increased supplies here and there.

CHINA CLAY. The market has been steady. Present indications lead to the prediction that the consumption for this year will exceed that for 1921.

DRY COLORS. Trade has increased over that of a year ago, owing to the lower prices prevailing now.

GAS BLACK. The needs of manufacturers have forced an advance in price which has not decreased the demand for this important ingredient in tire manufacture.

GASOLINE. A seasonal advance in price was announced about the middle of the month. Stocks are reported the largest ever held totaling 818,500,000 gallons March 1.

LITHARGE. The call for manufacturing purposes has shown a steady increase to which the rubber industry has contributed materially.

LITHOPONE. Some heavy imports have been received, going direct to consumers without impairing trade in domestic production which is very active and of quality superior to foreign lithopone.

SOLVENT NAPHTHA. This is in good supply but not in heavy request.

SUBLIMED LEAD. Some improvement in consumption has been noted. The price has been raised ¼-cent a pound.

SULPHUR. Business has been routine with prices steady.

SULPHUR CHLORIDE. Quite inactive.

TALC. For a considerable period all grades of foreign and domestic have been active at fair prices.

WHITING. Stocks are not excessive but sufficient to take care of the normal run of business developing.

ZINC OXIDE. There has been a steady growth in the needs of the tire manufacturers and rubber industry generally as spring advanced.

Most of the improvement comes from the tire makers who have been heavy purchasers. The present prices are expected to hold until the middle of the year in conformity with the practice of announcement of price changes quarterly.

## New York Quotations

April 27, 1922

Prices subject to change without notice

### Accelerators, Organic

| | | | |
|---|---|---|---|
| Accelerene (f. o. b. English port) | lb. | 13s. | @ |
| Adco | lb. | $0.75 | @ |
| Aldehyde ammonia crystals | lb. | .90 | @$0.95 |
| Aniline (f. o. b.) factory | lb. | .16 | @ .19 |
| Diphenyl-guanidine | lb. | 1.50 | @ |
| Ethylidene aniline | lb. | .85 | @ |
| Excellerex | lb. | .45 | @ .55 |
| Formaldehyde aniline | lb. | .45 | @ .50 |
| Hexamethylene tetramine | lb. | .72½ | @ .75 |
| Lead oleate (bbls.) | lb. | .07 | @ |
| Methylene aniline | lb. | .38 | @ |
| No. 999 | lb. | .14 | @ |
| Paradin | lb. | .39 | @ |
| Paraphenylene diamine | lb. | 1.60 | @ 1.70 |
| Speed-X | lb. | 1.50 | @ |
| Super-Sulphur, No. 1 | lb. | .50 | @ .60 |
| No. 2 | lb. | .25 | @ .30 |
| Super-X | lb. | .50 | @ |
| Thiocarbanilide | lb. | .33 | @ .50 |
| Vul-Ko-Cene | lb. | .35 | @ |
| XLO | lb. | 1.30 | @ |

### Accelerators, Inorganic

| | | | |
|---|---|---|---|
| Lead, dry red | lb. | .08¼ | @ .08½ |
| white, basic carbonate | lb. | .07 | @ .07¾ |
| Lime, flour, superfine | lb. | .02¼ | @ .02½ |
| Litharge, domestic | lb. | .08½ | @ |
| imported | lb. | .17 | @ |
| Orange, mineral | lb. | .11¼ | @ .13¼ |
| Magnesium, carbonate, light, (bags) | lb. | .05¾ | @ |
| calcined, light (bbls.) | lb. | .24 | @ .25 |
| calcined, ex. light (bbls.) | lb. | .45 | @ |
| calcined, md. light (bbls.) | lb. | .20 | @ |
| calcined, heavy (bbls.) | lb. | .05½ | @ .06 |

### Acids

| | | | |
|---|---|---|---|
| Acetic 28% (bbls.) | cwt. | 2.50 | @ 3.00 |
| glacial, 99% | cwt. | 8.50 | @ 9.50 |
| Cresylic (97% straw color) | gal. | .53 | @ .55 |
| (95% dark) | gal. | .48 | @ .50 |
| Muriatic, 20 degrees | cwt. | 1.10 | @ 1.25 |
| Nitric, 36 degrees | cwt. | 5.00 | @ 6.00 |
| Sulphuric, 66 degrees | ton | 17.00 | @17.50 |

### Alkalies

| | | | |
|---|---|---|---|
| Caustic soda | cwt. | 3.50 | @ 3.75 |
| Soda ash, 58% (bbls.) | cwt. | 2.00 | @ 2.10 |

### Colors

| | | | |
|---|---|---|---|
| **BLACK** | | | |
| Bone, powdered | lb. | .05½ | @ .07½ |
| Carbon black | lb. | .12 | @ .17 |
| pressed | lb. | .13 | @ .18 |
| Dipped goods | lb. | 1.00 | @ |
| Drop | lb. | .07½ | @ .16 |
| Ivory black | lb. | .15 | @ .45 |
| Lampblack | lb. | .17 | @ .45 |
| Micronex | lb. | .12½ | @ .17½ |
| Oil-soluble aniline | lb. | | @ |
| Rubber maker's black (non-flying) | lb. | .40 | @ |
| **BLUE** | | | |
| Cobalt | lb. | .21 | @ .26 |
| Dipped goods | lb. | 1.00 | @ |
| Prussian | lb. | .50 | @ |
| Rubber maker's blue | lb. | 3.50 | @ |
| Ultramarine | lb. | .10 | @ .35 |
| **BROWN** | | | |
| Iron oxide | lb. | .05 | @ .10 |
| Sienna, Italian, raw and burnt | lb. | .06 | @ .07 |
| Umber, Turkey, raw and burnt | lb. | .05¾ | @ .07½ |
| Vandyke | lb. | .06 | @ .08 |
| **GREEN** | | | |
| Chrome, light | lb. | .30 | @ .32 |
| medium | lb. | .35 | @ .36 |
| dark | lb. | .36 | @ .45 |
| commercial | lb. | .12 | @ |
| tile | lb. | .11 | @ .13 |
| Guignet | lb. | 1.50 | @ |
| Dipped goods | lb. | 1.00 | @ |
| Oxide of chromium | lb. | .45 | @ .57 |
| Rubber makers' green | lb. | 3.50 | @ |
| **RED** | | | |
| Antimony, crimson | lb. | .21 | @ .24 |
| crimson, F. | lb. | .35 | @ |
| crimson, R. M. P. reg. No. 3 | lb. | .48 | @ |
| Antimony, golden | lb. | .19 | @ .44 |
| golden, R. M. P. reg. No. 7 | lb. | .20 | @ |
| golden 1 | lb. | .30 | @ |
| golden 2 | lb. | .25 | @ |
| 7-A | lb. | .35 | @ |
| vermilion | lb. | .55 | @ |
| red sulphuret | lb. | .20 | @ |
| Arsenic, red sulphide | lb. | $0.12¼ | @ |
| Cadmium, sulphide | lb. | 1.85 | @ |
| Dipped goods, red | lb. | 1.00 | @ |
| purple | lb. | 1.00 | @ |
| orange | lb. | 1.00 | @ |
| Indian | lb. | .08 | @$0.12 |
| Indian maroon, English | lb. | .12½ | @ |
| Iron oxide, reduced | | | |
| grades | lb. | .10 | @ .12 |
| pure bright | lb. | .12 | @ .14 |
| Maroon oxide | lb. | .08 | @ .12 |
| Red oxide, crimson | lb. | .05½ | @ |
| English | lb. | .13 | @ |
| Spanish | lb. | .04 | @ .05 |
| Oil-soluble aniline, red | lb. | 1.70 | @ 1.95 |
| orange | lb. | 1.45 | @ |
| Oximony | lb. | .16 | @ |
| Para toner | lb. | 1.40 | @ |
| Rubber makers' red (four shades) | lb. | 3.50 | @ |
| purple | lb. | 2.50 | @ |
| Spanish natural | lb. | .03½ | @ .04½ |
| Toluidine toner | | 2.25 | @ 2.50 |
| Venetian | lb. | .02½ | @ .05½ |
| Vermilion, American | lb. | .25 | @ .30 |
| English quicksilver | lb. | .85 | @ .90 |
| **WHITE** | | | |
| Albalith | lb. | .06 | @ .06½ |
| Aluminum bronze | lb. | .55 | @ .60 |
| Lithopone, domestic (factory) | lb. | .06 | @ .06½ |
| Zinc oxide: | | | |
| American Horse Head (factory): | | | |
| Special | lb. | .08 | @ .08½ |
| XX red | lb. | .07½ | @ .08 |
| French process, Florence brand (factory): | | | |
| White seal | lb. | .11 | @ .11¼ |
| Green seal | lb. | .09¾ | @ .10½ |
| Red seal | lb. | .08¾ | @ .09¼ |
| Azo (factory): | | | |
| ZZZ (lead free) | lb. | .07½ | @ .08 |
| ZZ (under 5%) leaded | lb. | .07¼ | @ .07¾ |
| (8/10% leaded) | lb. | .07 | @ .07½ |
| **YELLOW** | | | |
| Arsenic, yellow sulphide | lb. | | @ |
| Cadmium, sulphide, light | lb. | 1.85 | @ |
| Chrome, light and med | lb. | .16½ | @ .17 |
| Dipped goods | | 1.00 | @ |
| India rubber | lb. | 1.00 | @ |
| Ochre, domestic | lb. | .02½ | @ .03 |
| imported | lb. | .03 | @ .03½ |
| Oil-soluble aniline | lb. | 1.55 | @ |
| Rubber makers' yellow | lb. | 3.50 | @ |

### Compounding Ingredients

| | | | |
|---|---|---|---|
| Aluminum flake (carloads) | ton | 25.00 | @29.45 |
| hydrate, light | lb. | .19 | @ .21 |
| Ammonia carbonate | lb. | .07 | @ .09 |
| Asbestine | ton | 20.00 | @25.00 |
| Barium, carbonate, | ton | 65.00 | @70.00 |
| dust | ton | 100.00 | @ |
| Barytes, pure white (carloads) | ton | 23.90 | @ |
| off color (carloads) | ton | 20.00 | @ |
| uniform floated (carloads) | ton | 23.90 | @ |
| Basofor | lb. | .04¾ | @ |
| Beta-naphthol | lb. | .28 | @ |
| Blanc fixe | lb. | .04 | @ .04½ |
| Bone ash | lb. | | @ |
| Carrara filler (factory) | ton | 18.00 | @ |
| Chalk, precipitated, extra light (f.o.b. factory) | lb. | .03½ | @ .03¾ |
| heavy (f.o.b. factory) | lb. | .02½ | @ .03¼ |
| China, clay, Dixie | ton | 22.00 | @ 32.00 |
| Blue Ridge | ton | 22.00 | @ 32.00 |
| Cotton linters clean mill-run | lb. | .04 | @ |
| Fossil flour (powdered) | ton | 60.00 | @ |
| (bolted) | ton | 60.00 | @ |
| Glue, high grade | lb. | .30 | @ .40 |
| medium | lb. | .20 | @ .26 |
| low grade | lb. | .15 | @ .18 |
| Graphite, flake | lb. | .10 | @ |
| amorphous | lb. | .05 | @ |
| Infusorial earth (powd.) | ton | 60.00 | @ |
| (bolted) | ton | 65.00 | @ |
| Liquid rubber | lb. | .15 | @ |
| Mica, powdered | lb. | *.15 | @ |
| Pumice stone, powdered | lb. | .03 | @ .05 |
| Rotten st., powd. (bbls.) | lb. | .02½ | @ .04½ |
| Silica, aluminum | ton | 22.00 | @23.00 |
| gold bond | ton | | @ |
| silver bond | ton | | @ |
| Soap bark, cut | lb. | .08½ | @ .09 |
| Soapstone, powdered-gray (carloads) | ton | 12.00 | @ |
| Starch, powd. corn (bags) | cwt. | 2.32 | @ 2.42 |
| (bbls.) | cwt. | 2.60 | @ 2.70 |
| Talc, soapstone | ton | 22.50 | @ |
| Terra blanche | ton | 23.00 | @25.00 |
| Tripoli flour, air-floated, cream or rose (factory) | ton | 25.00 | @30.00 |
| white (factory) | ton | 27.50 | @32.50 |
| Tyre-lith | ton | 85.00 | @ |
| Whiting, Alba | cwt. | | @ |
| commercial | cwt. | 1.00 | @ 1.25 |
| Danish | ton | | @ |
| English cliffstone | cwt. | 1.55 | @ 1.75 |
| gilders (bolted) | cwt. | 1.20 | @ 1.35 |
| Paris, white, American | cwt. | 1.25 | @ 1.50 |
| Perfection | ton | $20.00 | @$25.00 |
| Plymouth | ton | 16.00 | @18.00 |
| Quaker | ton | 13.00 | @15.00 |
| Wood pulp, XXX (f.o.b. factory) | ton | 30.00 | @ |
| X (f.o.b. factory) | ton | 25.00 | @ |

### Mineral Rubber

| | | | |
|---|---|---|---|
| Gilsonite | ton | 70.00 | @ |
| Genasco (factory) | ton | 50.00 | @52.00 |
| Hard hydrocarbon | ton | 32.00 | @42.00 |
| Soft hydrocarbon | ton | 30.00 | @35.00 |
| 320/340 M. P. hydrocarbon | ton | 47.50 | @50.00 |
| 300/310 M. P. hydrocarbon | ton | 42.50 | @45.00 |
| Pioneer, M. R., solid (fac.) | ton | 42.00 | @44.00 |
| M. R. granular | ton | 52.00 | @54.00 |
| Robertson, M. R. (factory) | ton | 35.00 | @75.00 |
| Rubrax (factory) | ton | 50.00 | @ |
| States "A" | ton | 40.00 | @ |
| No. 1 | ton | 35.00 | @ |
| Synpro, gran. M. R. (fac.) | ton | 54.50 | @69.50 |

### Oils

| | | | |
|---|---|---|---|
| Avoilas compound | lb. | .14 | @ |
| Castor, No. 1, U. S. P. | lb. | .11½ | @ |
| No. 3, U. S. P. | lb. | .10½ | @ |
| Corn | lb. | .12 | @ .13 |
| Cotton | lb. | .12½ | @ |
| Glycerine | lb. | .15 | @ .15½ |
| Halowax (500-lb. steel drums, returnable) | lb. | .25 | @ .27 |
| Linseed, raw, domestic | gal. | .81 | @ .92 |
| Palm lagos | lb. | .07¾ | @ .08 |
| Palm, niger | lb. | .06¼ | @ .06½ |
| Petrolatum, standard | lb. | .05 | @ .08 |
| Petrolatum, sticky | lb. | .08 | @ .10 |
| Pine, steam distilled | gal. | .85 | @ 1.05 |
| Rapeseed, refined | gal. | .83 | @ .84 |
| blown | gal. | .92 | @ .95 |
| Rosin | gal. | .38 | @ .40 |
| Synpro | gal. | .40 | @ .80 |
| Soya bean | lb. | .11¼ | @ .11½ |
| Tar | gal. | .22 | @ .29 |

### Resins and Pitches

| | | | |
|---|---|---|---|
| Cumar resin hard | lb. | .09 | @ .12 |
| soft | lb. | .09 | @ .12 |
| Tar, retort | bbl. | 9.00 | @ 9.50 |
| kiln | bbl. | 8.50 | @ 9.00 |
| Pitch, Burgundy | lb. | .04½ | @ |
| coal tar | lb. | .01½ | @ |
| hardwood | ton | 60.00 | @ |
| pine tar | lb. | .03½ | @ |
| ponto | lb. | .07½ | @ |
| Rosin, K (bbl.) 280 lbs. | | 5.90 | @ |
| strained (bbls.) 280 lbs. | | 5.80 | @ |
| Shellac, fine orange | lb. | *.85 | @ |

### Solvents

| | | | |
|---|---|---|---|
| Acetone (98.99% drums [6.62 lbs. per gal.]) | lb. | .08½ | @ .10 |
| Benzol (90%, drums [7.21 lbs. per gal.]) | gal. | .30 | @ .32 |
| pure (drums) | gal. | .29 | @ .34 |
| Carbon bisulphide (dms. [10.81 lbs. per gal.]) | lb. | .07 | @ .07½ |
| tetrachloride (drums. [13.28 lbs. per gal.]) | lb. | .10 | @ .13 |
| Motor gasoline (steel bbls.) | gal. | .26 | @ |
| Naphtha, V. M. & P. (steel bbls.) | gal. | .25 | @ |
| solvent (drums extra) | gal. | .24½ | @ |
| Paracymene (factory) | lb. | .15 | @ |
| Toluol, pure (7.21 lbs. per gal.) | gal. | .30 | @ .35 |
| Turpentine, spirits | gal. | .81 | @ |
| wood | gal. | .83 | @ |

### Substitutes

| | | | |
|---|---|---|---|
| Black | lb. | .08 | @ .13½ |
| Brown | lb. | .11 | @ .15 |
| White | lb. | .09 | @ .16 |
| Brown factice | lb. | .08 | @ .15½ |
| White factice | lb. | .08½ | @ .15½ |

### Vulcanizing Ingredients

| | | | |
|---|---|---|---|
| Lead, black hyposulphite (black hypo) | lb. | .42 | @ |
| Sulphur chloride (drums) | lb. | .08 | @ |
| (jugs) | lb. | .20 | @ |
| Sulphur, Bergenport brand, 100% pure (bbls.) | cwt. | 2.55 | @ 2.90 |
| (bags) | cwt. | 2.30 | @ 2.65 |
| Sulphur flour, rubber 100% pure (bbls.) 240 lbs. | | 2.60 | @ 3.15 |
| (bags) 150 lbs. | | 2.35 | @ 2.90 |
| Superfine 99½% pure (bbls.) 210 lbs. | | 2.40 | @ 2.90 |
| (bags) | cwt. | 2.00 | @ 2.50 |

(See also Colors—Antimony).

### Waxes

| | | | |
|---|---|---|---|
| Wax, beeswax, white, com. | lb. | .45 | @ |
| ceresine, white | lb. | .12 | @ |
| carnauba | lb. | .16 | @ |
| montan | lb. | .04½ | @ .05 |
| ozokerite, black | lb. | .18 | @ |
| green | lb. | .26 | @ |
| paraffine | lb. | .25 | @ |
| sweet wax | lb. | .12 | @ |

*Nominal.

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Reg United Kingdom.

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